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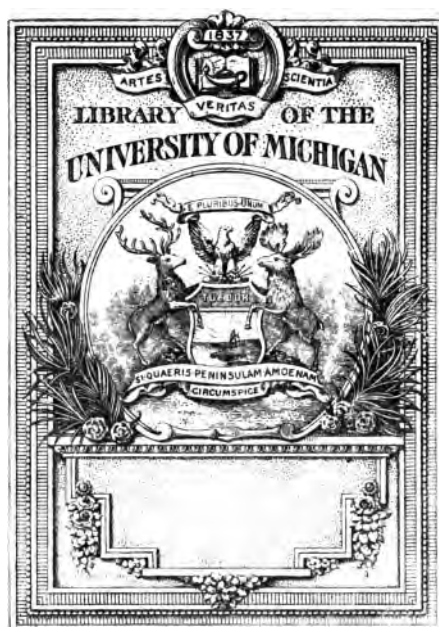
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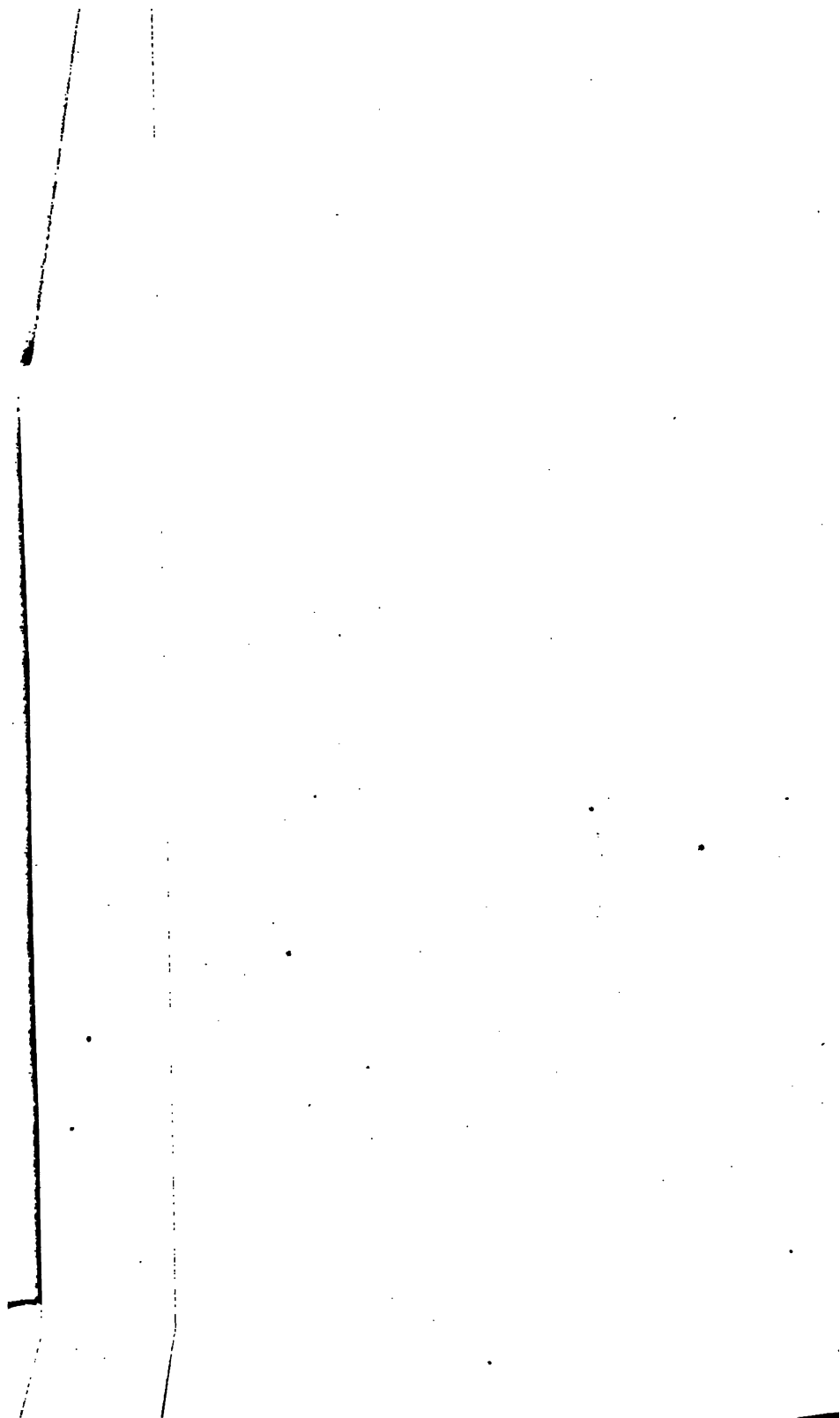
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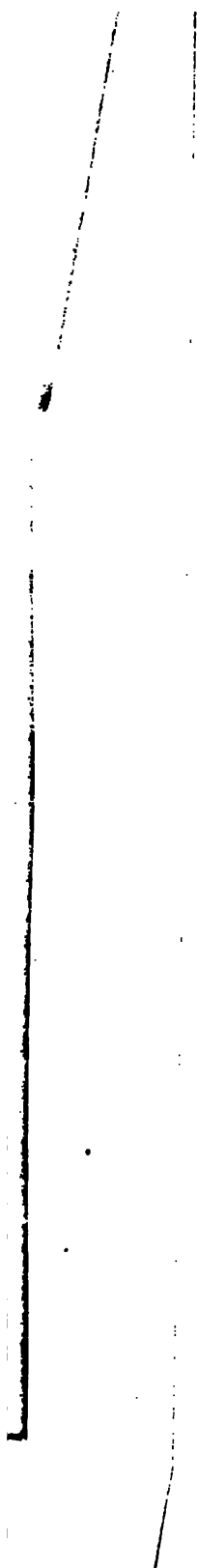
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GEOGRAPHIC INFLUENCE ON THE ECONOMIC HISTORY OF VIRGINIA.

BY

G. T. SURFACE.

The desire of gain, ambition for personal notoriety, and relief from religious or political oppression are the three important stimuli which have led to the discovery and occupancy of new territory. Each of these figured in the discovery and colonization of America. The commercial prompting predominated, since the great end to be achieved was the discovery of a shorter route to the South Sea, which would make the Indian trade more accessible. Whatever causes may have led to founding the Spanish settlements of the South, and later the Puritan settlements of New England, it is evident that the prospect of financial reward was the chief incentive which led to the settlement of that part of the American continent known as Virginia.

The expedition of Sir Humphrey Gilbert having proved a failure, Sir Walter Raleigh—his half brother—secured the patent renewed to himself, March 26th, 1584, and sailed April 27th from the west coast of England with two small vessels. He sailed by way of the Canaries, and reached the coast of Florida July 4th, thence northward nine days to 34° N. Latitude, and landed on Roanoke Island* at the mouth of Albemarle Sound. He entered possession in the name and right of the Virgin Queen, and planted the first Virginia colony. They found on the island deer, rabbits, and fowls. The natives brought them melons, walnuts, cucumbers, peas and grapes, together with skins, corals and pearls, which they gladly exchanged for knives, hatchets, and toys. The report of the Indians as to the beauty and wealth of the inland country was so favourable that Raleigh returned to England about the middle of September (1584) to make representation to Queen Elizabeth. She promised whatever assistance might be necessary for promoting and perfecting the

* According to Hariot's Treatise and With's map (both men were members of the expedition) they landed first on an island called by the natives Wococon, a small island off the coast between Cape Hatteras and Cape Fear. After a short sojourn here they set sail up the River Occam and the next evening landed upon Roanoke Island at the mouth of Albemarle Sound. Stith's History of Virginia, p. 10.

2 *Geographic Influence on the Economic History of Virginia.*

Roanoke settlement. A fleet of seven ships and one hundred and eight men was prepared, which set sail June 26th (1585) under command of Sir Richard Grenville. Ralph Lane was sent as Governor, and instructed to make extensive expeditions into the mainland. These were pushed eighty miles southward to the Indian village of *Secotan* (in the present County of Craven, North Carolina), and 130 miles northward to the Indian village *Chesapeake*, on the Elizabeth River (near the present site of Norfolk).

Raleigh arrived in midsummer and found food supplies so abundant that he provided inadequately for the next expedition, in consequence of which the colonists suffered greatly during the winter. This naturally discouraged them, and so great was their want that foul means were employed for securing food and skins from the Indians. Their enmity once aroused, they continued to harass the whites more and more. The following spring and summer failed to bring tidings or relief from England, all of which combined to make the condition more desperate. The promoters of the colony were utterly ignorant of the climatic conditions, and to this its failure is directly attributable. Sir Francis Drake, at the request of the Queen, visited the colony (August 1586) on his return from his successful expedition against the Spaniards* of the South, and so earnest were their entreaties that he took with him to England every surviving member. This for the time dampened the zeal for colonizing Virginia, but Drake's cargo of gold set the English merchantmen aflame with enthusiasm for finding the source of such fabulous wealth. History prepares the way. Raleigh fails to find its source in the South while on his Guiana-expedition. The trade with the East Indies had been extended, and the revenues of the country increased. The war with Spain had revolutionized and enlarged commercial relations in general and the defeat of the Armada laid the bed-rock foundation for English colonization. The time was ripe for the exploitation of new schemes and enterprises. Accordingly, in 1604, the merchants of London, Bristol, Exeter, and Plymouth organized two companies, the "London" and "Plymouth," the business of the first to be the establishment of colonies in Virginia between 34°-38° N. Lat., and of the second the establishment of colonies between 41°-45° N. Lat. The fleet of the London Com-

* The Spanish colonization in the South was primarily for the purpose of obtaining gold, and this they hoarded. The antagonism between England and Spain grew out of the Reformation. Most of the wealth with which Philip II built the Invincible Armada came from his American Colonists. It is estimated that by 1609 more than \$5,000,000,000 worth of gold and silver had been supplied. As Fiske aptly expresses it: "It was as the storehouse of the enemy's treasure and the chief source of his supplies that America first excited real interest among the English people."—JOHN FISKE, *Old Virginia and Her Neighbors*, Vol. 1, p. 9.

pany, consisting of three vessels, sailed December 20, 1606, under the command of Captain Christopher Newport, and arrived at the mouth of Chesapeake Bay, April 26th. They landed on the Cape and built a fort, naming both after Prince Henry. This was only to be used as a camp while selecting a suitable place for the establishment of the colony. The experience of the previous expedition had thoroughly convinced them that the most important essential was the ease and perfection with which the place could be protected from the attacks of the Indians. At the mouth of the largest river which had been sighted from the bay they found an island of sufficient size, connected with the mainland by a small isthmus. On this they landed May 13th, 1607, and planted the first permanent English colony in Virginia, which they named Jamestown. On the 22d of June, Captain Newport sailed for England with a cargo of sassafras and fine wood for wainscoting, the first shipment of Virginia products. Edwin I. Wingfield was appointed president, but was deposed, and succeeded by John Ratcliffe. The location proved very unhealthy, and many died of malaria. At the end of the first year the supplies were exhausted, and the Indian raids, starvation, and disease had much reduced the disheartened ranks. Captain John Smith was the only man in the colony who could inspire the colonists to perseverance. He was equal to the task when present, but his great desire to find a river flowing into the South Sea kept him almost constantly on exploring expeditions. It is stated that he was at Jamestown but three days in three months during the summer of 1608. In September of this year he visited the great Chief Powhatan at *Werowocomoco*, a village on the north bank of Pamaunke (York) River, for the purpose of delivering presents from the King. In the course of the interview he asked Powhatan about the country beyond the mountains, occupied by the powerful Monacans; and especially as to where *salt water* could be found in that direction. Powhatan declared with emphasis that there was no salt water beyond the mountains, and drew on the ground a map of that region. We may believe that it was very convincing to Captain Smith, as his further explorations were chiefly confined to the Chesapeake Bay and its shorter tributaries. Smith's map of Virginia was based upon personal observations and the information supplied by Powhatan. By means of pictures he depicted the game resources, which were to the early settlers one of the important economic resources. While Smith was exploring the Tidewater country most of the Colonists at Jamestown were engaged in gathering "gold dust," with which

4 *Geographic Influence on the Economic History of Virginia.*

the return vessels were loaded; but on their arrival in England it proved to be "fool's gold," being nothing more than micaceous earth brought down by the streams from the crystalline rock area of Middle Virginia. The first Colonial attempts at manufacture are set forth in Smith's address to the Royal Council of Virginia sitting in London, which message was sent by Captain Newport in 1608: "In their absence [the boats] I followed the new begun works of pitch and tar, glass, soap ashes and clap-boards."*

In the same message we have a reflection of the character of the colonists of this period: "When you send again [workmen], I entreat you to send but 30 carpenters, husbandmen, gardeners, fishermen, blacksmiths, masons and diggers of trees' roots, well provided, rather than 1,000 of such as we have These are the causes that have kept us in Virginia from laying such a foundation as ere this might have given much better content and satisfaction; but as yet you must not look for any profitable returns."†

The colonists found it difficult and dangerous to get an adequate meat supply from the forests, so Gates sent his admiral, George Summers, to the Bermudas in 1609 to capture hogs, which they had seen in abundance while shipwrecked on one of the islands. During the same year sheep, horses, goats, and poultry were introduced from Europe, and the following year cattle were brought from the West Indies. The extended use of meats made salt a much-needed article, and to meet this demand Sir Thomas Dale, deputy governor of the colony, detailed a party in 1612 from the Jamestown settlement to go to the *Kingdom of Accawmacke* (Accomac) to manufacture salt by boiling salt water. This first white settlement on the Eastern Shore was named Dale's Gift, and, because of the island's separateness from the other colonies, the Kings of England for many years addressed all of their decrees to the "*faithful subjects in ye colonies of Virginia and ye Kingdom of Accawmacke*." . . It was in the same year that John Rolfe (who was married to Pocahontas in 1614) began the cultivation of tobacco. Dale always had a strong faith in the possibilities of the new country. In a letter home in 1610 he said: "Take the four best kingdoms of Europe, and put them all together, and they may no way compare with this country for commodity and goodness of soil." It was he who abolished the system of industrial communism which had been in vogue since the formation of the colony. Each colonist was now allowed three acres for cultivation, for which he was to pay a yearly rent of 6 bushels of

* *Smith's works*, pp. 442-445.

† *Ibid.*

corn. The economic effect was magical; as a result industry and thrift began to prevail among the lawless and thriftless.

Until 1616 lumber was the only export of the colonies, and this in small quantities, chiefly in the form of clap-boards. During the year Captain Yeardley began the extensive cultivation of tobacco* which was indigenous to the country, and generally used by the Indians. Yeardley's predecessor Dale had enacted a law requiring that the cultivation of corn should take precedence over tobacco; but Yeardley set this at defiance, and encouraged the tobacco industry, to the neglect of all others. So great was the demand in England that, in 1619, the King placed a duty of a shilling per pound on tobacco, when the market price was only five shillings. The charter, however, called for exemption beyond 5 per cent., and settlement was effected by a compromise, in which one of the considerations was that the cultivation be forbidden in the Kingdom. In 1621, a monopoly† of the tobacco trade was granted to certain individuals, at whose request a proclamation was issued, limiting the exportation to 55,000 pounds. The close of the year showed the market to be overstocked, and the King advised the colonists to turn their attention more to the cultivation of corn and the raising of stock. To this end the tobacco crop was limited to 100 pounds per man. The introduction of slavery in 1622 fostered the tobacco industry still more, to the almost entire suppression of all others. The situation was critical, and to meet it the Assembly enacted laws authorizing the following bounties: 2 pounds of tobacco for every pound of flax or hemp ready for the spindle; 3 pounds for every yard of linen cloth a yard wide; 5 pounds for every yard of woollen cloth made in the province; and 10 pounds for every dozen pairs of woollen or worsted stockings. The legislature of 1623 ordered all settlers to plant mulberry trees; and in 1656 an act was passed imposing a fine on every planter who failed to have one mulberry tree to every 10 acres of land in his possession, but the labour surplus was inadequate for the silk industry even if all other conditions had been favourable. Prior to 1609 Smith had established three settlements: *Jamestown*, the seat of the colonial government; *Nansemond*, about 30 miles below Jamestown; and *Powhatan*, 6 miles below the James (Powhatan) River Falls. One hundred and twenty men were allotted to each, and the industrial operations radiated from these centres. We may feel sure that the early promoters were strongly imbued with the modern "boom" idea from the number of cities

* Indian name, *uppowoc*.

† This was the first tobacco trust organized in the history of the world.

6 *Geographic Influence on the Economic History of Virginia.*

which were founded only in name—James City, Elizabeth City, Charles City, City of Henricus (Henricopolis). The agricultural development decreed the conquering of the wilderness, and the names of the imaginary cities survived as the names of counties, the City of Henricus* being changed to Henrico. A reference to the map will show that each of these counties had a water front on at least two sides. In fact, streams constitute the political boundaries of the counties of Tidewater Virginia to an extent not to be found in any other province in the world.

By 1624 the colony extended from the mouth of the James River to the James River Falls, with plantations on both sides, and covered most of the peninsula between the James and York Rivers (the latter known as Charles River until 1642). Almost every plantation could be directly reached by boat. Although Captain John Smith left Virginia in 1614 not to return, he predetermined the sections most favourably situated for successful occupancy by his methodic study and careful observations made during his frequent river expeditions. His economic deductions were largely based upon what he saw. The condition of the Indians gave the most reliable evidence as to the resources immediately available. He found the tribes of the Lower Potomac† and Rappahannock comfortable and surprisingly peaceable. The tribes were also far more numerous, being 34 tribes north of the Rappahannock, and only 9 on the south side.‡ The superior oyster fisheries of the rivers and the neighbouring Chesapeake Bay waters made possible the friendly social relations by making easy the struggle for existence. Port Royal (Caroline County) was the terminus of the oyster beds. Fishing was not good above that point, and the stony land precluded cultivation with the wooden and stone implements, as a result of which we have no record of an Indian tribe residing permanently in the region. The tribes met with in the neighbourhood of Fredericksburg (Spottsylvania County) and Falmouth (Stafford County) were representatives of the implacable warriors of the stony interior region; which affords a striking proof of how much of the treachery and barbarity of primitive peoples is pressed upon them by the severity of the conflict for existence, in which only the strongest, shrewdest, and most daring can survive.

* Henricus, founded in 1611, was located on Farrar's Island, as the peninsula was called (near Appomattox, Chesterfield County).

† The Indian name for the upper Potomac was Cohongoruton. It is so named in the Act of 1738, defining Frederick County. The south branch of the river was called Wappatomake. Lord Fairfax used the name Potomack and Wappatowmack, and Cohongoruton disappeared.

‡ *Smith's Map of Virginia.*

The Indians of the "Northern Neck" Country being friendly, their presence presented an additional inducement to English settlers, by reason of the profits to be realized from their trade. It was in this region that the next English settlements were founded.

If tobacco was "king" in the James River country, the oyster may be aptly designated as *queen* in the "Northern Neck."

In the establishment of an industrial system much depends upon the forces and conditions which give rise to the initiative. The acquirement of food and clothing constitutes the first essential. This obtained, the most profitable commodity, or means of exchange, is next to receive attention. The Virginia colonists had to meet the first by hunting, fishing, the cultivation of corn, raising of livestock, and bartering with the Indians. All of the conditions precluded a surplus of food stuffs, so that these are ruled out at this stage as possible commodities for exchange. But even if they had been possible, the demand would have been so limited as to make the production unprofitable. They must produce a surplus of that for which there is a pressing demand in England to realize profitable results. What were the leading English imports? Iron and steel from Spain; copper from Sweden; wine, salt and canvas from France; silks and velvets from Italy; spices from Asia; and naval supplies, such as tar, pitch, cordage, masts and yards, from Russia and Poland. The search of the colonists for gold and copper had been futile; in 1620, iron mines were opened at the James River Falls, but abandoned because inferior; the grape was neither adapted to the climate nor soil; great difficulty was experienced in supplying the domestic demand for salt; the silk industry was then, and has ever been impracticable, because of non-adaptability of climate and lack of labour supply; and the great cost of transporting timbers made it impossible to compete with closer markets. Virginia's only hope, therefore, was to create a new demand, of which a surplus could be produced, for the purchase of the numerous supplies necessary to every country in the establishing stage. Fortune crowned the crisis in the introduction of tobacco. It is for this reason that tobacco has been called "king."

It seems timely here to inquire into the economic foundations of Virginia society, which has always been a type of Southern society, and why it so radically differed from that of New England. The social status of any differentiated society or community is fixed by the elemental habits and characteristics of the individuals comprising the group; and by the environment—the objective forces brought to bear on the subjective individual. Of these forces, the geographic

conditions and the economic relations are by far the most important. Let us first inquire into the nature of the individuals. The early Virginia colonists were essentially of the English gentry on the one hand, and of the free and bond servant classes on the other, with a few who could lay claim to the nobility. This condition existed because the enterprise was primarily commercial, and, in consequence, appealed to the moneyed interests; which in turn required labour for carrying out its purposes. The promoters had neither political nor ecclesiastical grievance, and were not bound by the stress of poverty, so they adhered to their old habits, manners, tastes and styles of living, in so far as the new conditions permitted. The same strict adherence to the Church of England, and largely to the Crown, was also maintained for more than half a century. The plantation owners prospered, and increased in influence in the political arena to a position which they had found impossible in the mother country. The whole tendency was toward the establishment of large holdings. The extreme eastern coast was malarial, while further inland the climate was healthful, the soil fertile, and an abundance of game, which feature alone was very inviting to the English *gentleman*. England pushed slave labour into the colony as rapidly as it could be utilized. The dissolution of the Company in 1624 augmented the tendency to large estates, as its policy had been restraining in a measure, by making the landowners of two kinds—the planter, who held grants of land proportionate to his contribution of money and emigrants, and the small holder, who received an allotment as remuneration for working on the Company land during a certain period. On the dissolution no change was made in the tenure, except that the free emigrant had to go out at his own expense, and bound in an agreement to bring the land under cultivation within a certain period or forfeit the right of ownership. Under this régime the yeomanry class did not progress, for the reason that they lacked administrative ability; and having grown accustomed to routine labour and dependence, became easily discouraged under the pressure of poverty, responsibility, and the stronger external hand of the landed aristocracy. Becoming poorer, they became free servants.

The increased prosperity of the planter prompted to a life of ease and independence. In most cases he was not even placed under the necessity of finding a market, or of concerning himself as to the ways and means of securing supplies, since foreign vessels loaded with a variety of merchandise came up to the plantation wharves to exchange their goods for tobacco. So satisfactory were the returns

of soil tillage that the manufacturing enterprises were not prosecuted assiduously, except for those which could be done at home, by way of utilizing the surplus labour. The attitude of the representative planter is vouched for in the words of Thomas Jefferson: "Such is our attachment to agriculture, and such our preference for foreign manufactures that, be it wise or unwise, our people will certainly return to the raising of raw materials, and exchange them for finer manufactures than they are able to execute themselves. The political economists of Europe have established it as a principle that every state should endeavor to manufacture for itself, and this principle, like many others, we transfer to America without calculating the difference of circumstance which should produce a difference of result."*

I have not heard the opinion expressed, but I believe that slavery exerted a characteristic influence on Virginia society as marked as was its influence on the industrial system. It should be remembered that up to this time the great majority of those who had set the pace of a social system so individualistic as to stand out for generations as characteristic of the typical Virginian were slave owners and slave workers, and not slave traders. Most of the slaves of this larger class felt themselves not only a constituent part of the plantation, but an indispensable part; and so they were under the existing régime. This accorded to the servant a feeling of self-importance, which found its counterpart in the personality of the master. The rich of every age are very much the same in being caterers to the recognition of the Court, the nobility, and the rich; and we may as truly add, to the humble, joyous—and in some cases worshipful—recognition of those who serve them. The latter existed in the person of the "old-fashioned darkey," as he can never be again. The plantation equipped with a full retinue of servants and slaves felt that it was a sufficiency unto itself, which, to an extent incalculable, fostered the clannish tendency toward seclusion, and intensified the ultra-individualism of the cavalier type.

Prior to 1688 Virginia adhered strictly to the Church of England, even to legislating against the Puritans, Quakers, and Separatists; and contested vigorously the position of the Presbyterians within her border. But while this ecclesiastical attitude had been maintained, and its power exercised, the idea of civil liberty was gaining strength in many parts. This had been brought about in part by

* Jefferson's Notes on Virginia, p. 225 (1781). After the rupture with England, manufacturing was much more emphasized than before. The domestic wants were largely supplied by home manufactures, until the development of factory enterprises in New England, which were not extensive at the time Jefferson wrote his "Notes on Virginia."

10 *Geographic Influence on the Economic History of Virginia.*

oppressive taxation, and the indirect connection of the House of Burgesses with the Crown; but in an important sense through the influence of that prosperous, free, easy, isolated, independent life. As the civil attitude changed, the loyalty to the Established Church began to weaken. In 1696 a law was passed fixing the salary of every clergyman at 16,000 pounds of tobacco. The price so fluctuated that this made the salary quite variable. In some parishes only "Orinoco" could be raised, which was inferior to "sweet-scented." The books of that time bear frequent reference to a promotion from an "Orinoco parish" to a "sweet-scented parish." Where tobacco was not grown the Established Church was without representation, and it was "in the tobaccoless wilderness voices were heard of the Baptists, Quakers and less definable dissenters, who were directing the pioneer ax to the root of the established tree that protected the throne."*

The House of Burgesses passed an Act in 1755 enabling debtors to pay their tobacco obligations in money at the rate of 16s. 8d. per hundred pounds. The price of tobacco rose by reason of the drought, and many clergymen demanded payment in tobacco. A number of suits were instituted during the succeeding years, the final one being the appeal of Rev. John Camm to England in 1767. This case was heard before Colonel John Henry, the father of Patrick Henry. Patrick Henry had always been loyal to the Church and the Throne, but he grew so indignant over the controversies that he flamed out in such an arraignment of the clergy as to break the authority of the Established Church, and thus became the darling of the Dissenters, the herald of the people's rights. As a result he was ardently supported when the Stamp Act agitation arose.†

* * * * *

The mountainous portion of the State was destined to produce a different type of society. We have seen how distinctly different were the characteristics of the Indians of the western part of the State (Monacans) and the eastern tribes. During the first century of Colonial history no attempt was made toward settlements in the mountains. They were not adapted to the use of slave labour, were frequented by the most treacherous Indians, and so remote from

* Barons of the Potomac and Rappahannock. It was seen in the Chapter on Population that the Scotch-Irish Presbyterians were the leaders in the movement.

† The American Revolution really began with the resistance of the colonies to the irritating duties and regulations imposed by the Crown on the cultivation of tobacco.

It should also be remembered that a long contest in the reign of James I, which began with the discussion of the tobacco question, resulted in largely transferring the power from the Crown to the House of Commons.

market and void of transportation facilities as to be wholly impracticable for occupation.

The competition of slaves was very irritating to the free labourers of the East, and it was difficult to obtain small holdings, so dominant and domineering was the influence of the large owners. As a result, the bravest, strongest and most resolute of the free labourers forced their way westward and joined the Scotch-Irish Presbyterians*, who were coming in large numbers to the Valley as well as to the Piedmont frontier. These were the mountaineers of the eighteenth century, but must not be confused with that class known as "poor whites," either according to present or past acceptance of that term. It is true many of them were poor in possessions, but rich in valour, and came from the great middle class who had tired of landlord oppression in England, and slavery competition in eastern Virginia. The indolent, thriftless, lower class followed in their wake, but at a safe distance—far enough removed from the old settlements to eke out a bare existence by hunting and little work. On the mountains they remained in preference to subduing the great forests of the fertile intervening valleys, and there they are for the most part to be found to-day. In the middle of the eighteenth century the life of western Virginia compared with that of Tidewater as does the ranch life of the Rocky Mountains and the Plains with modern New England society life. From the first it was a life-and-death struggle, in which the weaklings were sure to go down. No man could stand alone, and so by ties of mutual sympathy and protection they were united in hearty, unselfish fellowship. As a class they were clannish, and more or less superstitious; loyal in their friendships and inexorable in their hates, but brave, just, generous, and industrious. It was these iron-nerved, steel-sinewed stalwarts who formed a line of mountain outposts between the older settlements of the coast and the treacherous Indian tribes of the west. Not only did they drive the savages beyond the mountains but followed them into the plains, and broke for all time the powerful confederacy. It was also these who, in that memorable battle of King's Mountain, turned the tide of the Revolution. They represent to-day a reserve force in the nation whose vitalizing lines are found to connect with all the throbbing centres of educational, commercial, and political activity.

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For the sake of comparison, let us question briefly why the social

* See Chapter on Population.

12 *Geographic Influence on the Economic History of Virginia.*

and industrial life of New England was so different from that of Virginia.

In 1614 Captain John Smith made a trading expedition to that territory, at which time he changed the name from *North Virginia* to *New England*. Although his sojourn was ostensibly for purposes of trade, on his return to England he left Captain Thomas Hunt in charge of one vessel, presumably to establish a footing, looking toward a permanent settlement; but Hunt enticed 27 Indians on board and sailed with them to Malaga, where he sold them to the Spanish at 20 pounds per head. This so enraged the Indians that they resented every effort toward colonization with great vigour and extreme ferocity. If there is anything which will put a people on their mettle "to do or die," it is an experience of exile for religious convictions; so the Puritans, many of whom had taken refuge in Holland before the intolerable attitude of Queen Elizabeth, were best prepared to drive the wedge. It was a congregation of Independents or Brownists, the strictest sect of the Puritans, that landed from the Mayflower December 11th, 1620, and others followed in rapid succession. The first colonists were as a rule poor, not having had the opportunity to accumulate, and the wealthier and more tractable Dissenters remained in England until the venture was tested. Those who came sought freedom above everything else, and expected to pay the price in unrelenting toil. The conditions placed upon them a strong community of interest, which had been growing since the foundation of Protestantism. They were thoughtful, sober, and economical. Being parties to a common cause and participants in a common lot, they became naturally characterized by unanimity and equipoise. Life to them had been a severe drill in meeting the emergency, which developed the genius of invention, and prepared them in all respects for distinction along the lines which were pursued later so successfully.

The soil was not fertile and slave labour proved unprofitable. The South needed labourers and purchased them. English vessels were monopolizing southern traffic, so New England naturally decided to build ships and participate in the profits. As carriers, the opportunity of brokerage presented itself, and they shared in the profits of sale and distribution. New trading enterprises were contagious, and the business expanded with the traffic. The Revolution came, the conclusion of which ruled England out as neither a desirable competitor in transportation nor in the traffic of slaves and merchandise. New England stood ready to enter upon her new era of prosperity. It is true that the moral reaction against slave owner-

ship had already become strong, but an earnest plea was made for the trade to tide her over the financial stress. This granted, her profits grew into a large surplus. Since the importation of slaves could continue no longer than 1808, the traders of New England were naturally on the lookout for investment opportunities, for the finding of which their extensive transportation and trade relations offered the best opportunity. They studied the methods by which England was growing rich. The manufacture of clothing constituted one of her most profitable industries, and Whitney's discovery of the cotton-gin, which revolutionized the production of cotton in the South, was New England's opportunity for the establishment of the American textile industry on even a more profitable basis than the English system. The manufacturing interests prospered, and the shipping interests suffered no loss, as the South became a large exporter of cotton. We conclude from this brief review that, just as the South from the very beginning of her history naturally developed along agricultural lines, so New England, finding herself at a disadvantage in the cultivation of the soil, naturally turned her attention to manufacture, trade and commerce.



PHYSIOGRAPHY OF VIRGINIA.

BY

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The surface features are so closely connected with the geological history, and this in turn is so important in the determination of economic control, that we will discuss the physiographic phase from the view-point of geologic grouping and sequence. It is our purpose to give the reader a consistent portrayal of the Virginia land-mass at logical intervals during its physiographic evolution. The conclusions arrived at are based upon the most accurate information obtainable, in the absence of a complete topographic or physiographic survey of the State. As viewed from the standpoint of origin the land-mass divides itself into two major divisions: I. Appalachian Belt; and, II. Coastal Plain Belt.

APPALACHIAN BELT.—The classification recognized under this division is somewhat arbitrary, but we believe it is entirely in harmony with the similarity and continuity of geographic control, which centred about the original Atlantic land-mass until towards the close of the Mesozoic era.

- (A). *Archaean system* of the Archæan period.
- (B). *Taconic system* of the Middle Silurian period.
- (C). *Appalachian system* of the post-Carboniferous period.
- (D). *Palisade system* of the Jurassic period.

A. *The Archaean System.*

This represents the older Appalachian belt, or the Appalachian *protaxis*, which extends in a narrow peninsular band from Canada to central Georgia. It is continuous through Virginia, and the present exposure varies in width from 10 to 40 miles. It is probable that the materials of the Taconic and Palisade systems were deposited in valleys and bays which had been carved out of the Archæan land-mass, or in synclinal troughs formed therein by elevation and depression. This would indicate that the area extended farther

eastward at the close of the period. The enormous amount of material supplied for the formation of the Appalachian system adds evidence to the same conclusion. We can form no estimate of the height of the land-mass, but all of the conditions lead to the belief that it was thoroughly mountainous in type, and probably varied from 5,000 to 25,000 feet in elevation. Even with this estimate, we must suppose it to have been a region of elevation during a part of the Paleozoic era to account for the immense sedimentary deposits of the Appalachian system. The region suffered re-elevation during the elevation of the Appalachian system, as shown by the west-northwest overthrust of the crystalline beds on the lower Silurian beds, and the intense metamorphism to which the rocks have been subjected. Since the thrust force which produced the newer Appalachians was from the southwest, the effect on the Archæan area must have been to increase the area along the western border and to make the topography more precipitous along the western flank of what might be designated the Piedmont Chain. The Archæan area was of sufficient elevation in post-Paleozoic time to effectually cut off the new Appalachian region from an eastward drainage. The region varies in elevation from 300 to 1,200 feet, increasing in general as we progress westward. The drainage is entirely into the Atlantic, and has a uniformly southeast direction. The Potomac, Rappahannock, York, James, and Roanoke Rivers are the most important streams. They are *transverse*, in that they flow at angles to the direction of strike of the intricately folded and foliated structure; and they are *antecedent*, in that their position was fixed prior to the rejuvenation of the old topography.

The *watersheds* between the drainage systems are indistinct, which is characteristic of a region which has reached advanced maturity.

The valleys are usually narrow but productive, and the intervening ridges vary in productivity according to the conditions of previous cultivation, the nature of the underlying rock, and the degree of decomposition. The percentage of iron present is greatest along the western border.

Large beds of iron ore occur in the Archæan series. The rocks consist chiefly of granites, gneisses, syenites, diorites, gabbros, and various schists, and cover most of the region known as the Piedmont Plateau, which extends from the *Fall Line* (where the rivers emerge from the harder rocks of the inland on to the Coastal Plain) to the slope and crest of the Blue Ridge. These crystalline and metamorphosed rocks are believed to represent a part of the original crust of the earth, and to have been first elevated by the unequal contraction of

the outer cooling crust on the inner molten mass. Most of the rocks weather easily by the decomposition of the iron, alkalis and phosphates, which, when entirely removed, leave a light sterile micaceous or sandy soil. The percentage of these elements left largely determines the productivity of the residual soils, which makes a chemical study of them very necessary for the intelligent application of fertilizers.

The present Piedmont topography is that of a dissected plateau upland, the seaward remnant of a broad, gently rolling surface, which once extended westward beyond the Alleghany Front, northward along the Appalachians into New York and New England, and southward across the Cumberland Plateau of Tennessee to an unknown distance. This peneplain condition of the Jurassic period was first described and studied by Professor W. M. Davis in Pennsylvania and New Jersey, and was named by him the *Schooley Peneplain*.* Professor Davis describes the Piedmont Plateau in its present dissected stage as illustrative of the peneplain. "It is a peneplain, not monotonously smooth, but undulating in graceful swells, between gentle depressions."—(Davis.) Mr. Willis, of the United States Geological Survey, in his physiographic study of the Northern Appalachians, gave the name of Kittatinny Plain to this older base-level stage.†

B. Taconic System. (Middle Silurian.)

We will see under the discussion of the Appalachian System that at the beginning of the Paleozoic era there was being formed a great *geosyncline* along the western border of the Archæan land-mass. There was another geosyncline being formed at the same time along the eastern border. The indications are that there was a chain of these depressions, some of which were probably troughs of embayed synclinal valleys within the crystalline area. They were closely parallel to the Archæan *protaxis* and the Appalachian *geosyncline*, and extended from the region which marks the boundary between Canada, New England and New York, through Pennsylvania, Maryland and Virginia, and south-westward. These deposits thickened in the gradually sinking trough through the Cambrian and Ordovician periods, and at the close of the latter period were elevated into what has been called the *Taconic System*. The upturning resulted in great flexures and faults, and extreme metamorphism. The rocks present the same general characteristics as the Cambrian and

* Davis, W. M., "The Rivers of Northern New Jersey." National Geographic Magazine, 1890, vol. II., pp. 81-110.

† Bailey Willis—Physiography of the United States, p. 189.

Ordovician rocks of the Appalachian system, with the addition that the shales, sandstones and limestones are highly metamorphosed. The shales of Buckingham County have been definitely identified as belonging to the Trenton and Hudson epochs, and are a part of the Taconic series. The beautiful mottled brown and reddish brown marbles of east Tennessee belong to the same series (Hawkins and Knox counties). It continued a region of elevation, and therefore of denudation, through the Upper Silurian, Devonian, Carboniferous, Triassic and Jurassic periods, for no beds with marine fossils have been found over the area.

The series has suffered greatly from decomposition and erosion, which were facilitated by the crushing and disruption of the beds as caused by the violent crustal movements.

Great changes must have been wrought in the structure and surface features of the Taconic area by the forces which raised the Appalachian geosyncline into the towering *Appalachian Chain*.

The residual soils from the metamorphosed limestones are the most productive which occur in this belt. The shales and slates give rise to soils that are responsive to fertilizers and improved cultivation.

The streams cut across the strata as in the case of the crystalline series of the Archæan system.

C. Appalachian System.

Throughout the long Paleozoic era the material for the construction of the Appalachian system was in process of formation, at the expense of the surrounding crystalline area. These sediments were deposited in a great geosynclinal trough, in which the rate of subsidence was so nearly equal to the rate of deposition that almost the entire thickness was accumulated in shallow water. At the close of the era the crustal movements began, through which the strata were elevated and compressed into a series of parallel, inclined or overturned folds, with an elevation of 20,000 to 40,000 feet. In some places the overturned folds pass into *overthrust* faults. One of these in the southern Appalachians of Virginia represents a dislocation of 5,000 to 10,000 feet, by which the Lower Silurian limestone is brought in juxtaposition with the Lower Carboniferous sandstone. This fault so weakened the strata through crushing and disruption as to invite maximum erosion and decomposition, resulting in the removal of all the strata above the Silurian. H. B. Rogers pointed out that the lines of faults in Virginia are continuous with

the flexures in Pennsylvania. The faults may therefore be designated as *flexure faults*. The structure of the Appalachians closely resembles that of the Alps. The thrust force, however, in the case of the Alps was toward the ocean, while that of the Appalachians was from the ocean. The pressure, being greatest from the ocean side, gave rise to asymmetrical and inverted folds, and the mountain ranges decline into an elevated plateau on the landward side, with feebly undulating or horizontal stratification. This is exemplified in the West Virginia Highland and the Cumberland Plateau of Tennessee. This high mountain region was worn down to an undulating plain (Schooley or Kittatinny peneplain) during the Triassic and Jurassic periods, with surviving ridges here and there of more resistant structure.

Towards the close of the Jurassic period the region was subjected to a moderate and gradual re-elevation, attaining a maximum in Virginia of 1,400 feet (Willis). The arch-lines follow the general strike direction of the Appalachian folds. This period of elevation rejuvenated the streams on the uplifted plain, making the valleys deepest where the elevation was greatest, and most shallow where the uplift was least. A revolution of the drainage system was initiated over a part of the region in the denudation attack along the lines of induced weakness. The change was greatest over the Appalachian region proper, since most of the dynamical agencies work more effectively on sedimentary rock structure. The excavation of the valleys along the belts of weaker structure has resulted in a physiography more nearly approaching the mountain type than existed at the close of the re-elevation of the region. Most of the remnant ranges and the intervening valleys are the result of circum-denudation, the height of the ridges and the width of the valleys being the expression of the relative strength of the strata, and the amount of subsequent elevation. The *transverse* streams are contemporaneous with the larger *longitudinal* ones, but have only been able to carve out for themselves narrow valleys or precipitous gorges. From the standpoint of soil production they have added but little; but their economic value cannot be overestimated, since they have established natural locations for the great transportation routes across the Alleghany Mountains, and present ideal conditions for the most economic utilization of their superior water power.

The Appalachian *anticlinorium* has lost its physiographic identity, but it is readily revealed in a study of the structure as exposed by the stream dissection and surface denudation.

That part of the Appalachian System draining into the Atlantic

Ocean is known as the Northern Appalachian, while the part south of New River, draining into the Gulf, is the Southern Appalachian.

The following subdivisions of the *system* are readily recognized in a topographic study: (1) Blue Ridge; (2) Valley; and (3) Appalachia.

(1) *Blue Ridge*. This stands out as the most prominent physical feature in the State. With an elevation of 1,460 feet at Harper's Ferry, where the Potomac breaks through the Blue Ridge, it increases southwestward, being 3,993 feet in Bedford County (Peaks of Otter), and reaches a maximum of 5,700 feet in Balsam Mountain, Grayson County, Virginia. This is a continuous barrier from the Maryland to the North Carolina boundaries, excepting four water-gaps and occasional wind-gaps. In its higher altitudes the crest line is marked by a hard, resistant sandstone of the Lower Cambrian period. The southern portion expands into a fan-like plateau, which is the watershed for the waters flowing into the Atlantic Ocean and the Gulf of Mexico. The counties of Floyd, Carrol, Grayson, Franklin, and a part of Montgomery are situated in the plateau portion. In North Carolina the plateau topography is intensified, and the elevation increases to a maximum of 7,000 feet.

The eastern flank of the Blue Ridge consists for the most part of highly metamorphosed Archæan rocks which formed the Paleozoic shore of the interior sea, and were thrust up by the great forces which gave birth to the Appalachian System. Along the crest, the western flank, and the western foot-hills, the Cambrian rocks predominate. Well-identified fossiliferous shales of the Lower and Middle Cambrian occur near Natural Bridge, and at Balcony Falls (James River gorge through the Blue Ridge at Balcony Falls). So far as developed for minerals, this is the most unproductive region in the State.

(2) *The Valley*. This is a continuation of the Great Valley of east Tennessee, and becomes the Cumberland Valley in Maryland and Pennsylvania, the Kittatinny Valley of New Jersey, and the Newburg part of the Hudson River Valley in New York. It is the central part of the *Greater Appalachian Valley*, as described by Willis, which includes the Blue Ridge, the Valley, and the Alleghany Ridges. The Valley region is that which lies between the western base of the Blue Ridge and the eastern base of the Alleghany Front. It is 15 to 30 miles in width, and 310 miles in length, making an area of about 5,000 square miles. It consists of the following minor valleys: The Shenandoah, 106 miles; James River, 50 miles; Roanoke River, 38 miles; New River, 54 miles; and

Holston River, 52 miles. For the purposes of convenience we may recognize three general sections: The *northern*, or Shenandoah Valley section; the *central*, embracing that region between the headwaters of the Shenandoah and the Holston Rivers, which is cut by the transverse valleys of the James, Roanoke and New Rivers; and the *southern* section, that part drained by the Holston River.

Viewed topographically, it is a broad, gently rolling plain, with the floor dissected by minor drainage systems. The elevation increases south-westward and westward, being 242 feet above tide at the mouth of the Shenandoah, and 1,687 feet where the Holston River crosses the State line. The maximum elevation of 1,700 feet is reached in Wythe County. The Shenandoah Plain was carved out of the *Schooley Peneplain* during the Tertiary period, and the subsequent elevation and denudation have brought it to its present topographic condition.

The soil of the valley is prevailingly limestone, and it is by far the most productive of the natural divisions. George Washington* realized its great possibilities when he wrote: "In soil, climate and production, in my opinion, it will be considered, if it is not considered so already, as the Garden of America."

There is no marked decrease of fertility as we pass from the bottoms to the uplands. The bottoms are utilized intensively and extensively for cultivation, and the uplands for grazing.

Settlements were made in the region as early as 1732. Several of the earlier ones were exterminated, but the natural conditions were so favourable that each depredation by the Indians inspired the settlers to stronger and more persistent resistance.

The position of the Valley topographically marks it out as a natural transportation route, so we find the Norfolk and Western Railroad traversing it from Bristol, which is on the Virginia-Tennessee line, to Roanoke; from this point the Shenandoah Valley extends to Harper's Ferry, on the Virginia-West Virginia-Maryland line.

(3) *Appalachia*, or *Alleghany Ridges*. This area embraces the region between the Valley and the Alleghany Front, which is the eastern border of the Alleghany Plateau, and is made of a series of ridges of northeast-southwest direction, alternating with narrow trough-like valleys. This general topography is interrupted where intersected by the transverse valleys, previously referred to. An examination of the ridges shows a remarkably accordant topography. They are believed to be the remnant of a plain of advanced topo-

* Letter to Sir John Sinclair, 1796.

graphic maturity formed during the Mesozoic era, which was continuous from Piedmont to the Alleghany Plateau, called by Davis the *Schooley Peneplain*, and by Willis the *Kittatinny Peneplain*. The region under discussion has been reduced to its present topographic condition since the Jurassic period by denudation and periods of elevation.

The ridges owe their elevation chiefly to the fact that the Carboniferous conglomerates and sandstones were depressed below the general level of the Kittatinny Peneplain, and thus escaped being worn away during the production of that feature. Subsequent elevation and denudation have removed the weakened anticlinal rocks, and left the synclinal remnants of hard sandstone standing out in relief, as protecting caps to the softer strata beneath.

Like the land of the Valley, the Blue Ridge and the Alleghany Front, these ridges increase in general elevation southward. Many of them exceed 3,000 feet. Elliot's Knob, 20 miles west of Staunton, has an elevation of 4,473 feet.

The Appalachia and Valley topography of southwest Virginia has been materially influenced by a series of faults which produced a displacement of 500 to 12,000 feet. The most important we may designate the *Saltsville* or *North Holston* fault, with a maximum displacement of 10,000 feet; the *Walker Mountain* fault, with a maximum displacement of about 10,000 feet, and seemingly continuous with the *Great Fault* of Northern Virginia; and *Draper Mountain* fault, which by a maximum displacement of 12,500 feet brings up the Lower Silurian in Wythe and Pulaski County as a rugged mountain in the heart of the Valley. Two cross-faults pass from it, the *Max Meadows* in a westward direction, and the *Pulaski* in a north-western direction, toward the Walker Mountain fault; so that in the very heart of the Valley there is a block of Upper Silurian, Devonian and Lower Carboniferous, with Lower Silurian on two sides, Cambrian on the third, and Lower Carboniferous on the fourth.*

The soils of the upper slopes are usually sandy and sterile, being derived from the heavy siliceous sandstones and conglomerates. Beneath these strata occur the softer shales, some of which (the most calcareous) form fairly productive soils. The residual soils from limestone are always fertile, but most of the limestone strata have been removed by denudation.

Because of the very broken topography common to the region, it is best adapted to grazing. The narrow valleys are made up of

* *American Journal of Science*, 1887, p. 262.

sandy calcareous alluvium, with often a strong impregnation of iron, and are productive. Cultivation is concentrated on the valleys and lowlands.

More virgin forest survives in this belt than in any other part of the State, because of its inaccessibility. With the superior water power, which abounds throughout the region, the manufacture of hardwood products should become an important industry.

This is the most productive region of the State in mineral resources.

The bold south-eastward-facing escarpment of the Alleghany Plateau border constitutes the western border of the Alleghany trough. The State line is approximately marked by it, except in the southwest corner.

From Little High Knob (26 miles south of the Potomac in the Virginia-West Virginia boundary) southwestward it declines in elevation.

New River, flowing north-westward, enters the plateau in a cañon 1,500 feet deep. All the other streams crossing the Front rise in the plateau and flow southwestward, to emerge from deep cañons into the minor valleys of the Great Valley. This peculiar drainage adjustment was brought about by a southeastward tilting of the northern part of the plateau in the elevation subsequent to the Schooley Peneplain stage, while south of the New River divide the tilting was to the southwest.*

D. *Palisade System.* (Jurassic Period.)

At the beginning of the Triassic period it is probable that the Virginia land area extended farther east than it does at this time. During this period a series of narrow troughs was formed along the Atlantic slope, closely parallel to the trend of the Appalachians, as if occupying orographic valleys in the chain; but separated from them by the remnant ridges, which were still sufficiently high to effectually cut off the Appalachian drainage from the east. The depressions could not have been formed from an oceanic submergence, for no marine fossils have been found in the beds; neither could they have resulted from stream action alone, or the nature of the rock structure would be different. The most probable supposition, therefore, is that the depressions represent the topography of the continental border after the Appalachian upturning. The water accumulated in these depressions in estuaries, fresh-water lakes, streams, bogs and swamps, and the depositions took place slowly and to great depth. The rocks

* Russell, I. C., *Rivers of North America*, p. 205.

are mostly granitic sandstones, sandy shales, conglomerates, bituminous coal, along with carbonaceous shales. The extent of the conglomerate formation and the prevalence of the cross-bedded structure give evidence of the presence of strong currents.

The longest trough seems to have been continuous from the Hudson River south through New Jersey and Maryland, and into Virginia as far as Cumberland County, a distance of 350 miles. It is probable that the Richmond area was a separate basin, 35 miles in length; and that the Pittsylvania area belongs to the Dan River trough of North Carolina, 100 miles in length (40 miles in North Carolina). The thickness of the beds in Virginia varies from 2,000 to 3,000 feet.

Productive coal beds occur in the Richmond* basin south of the Chickahominy River, being northwest of the city of Richmond, and separated from the northern part of the Richmond Mesozoic area by an interval of crystalline rocks about 3 miles in width. This is the only Mesozoic area in Virginia which retains the basin form in its present structural condition.

The lateral pressure which caused the elevation of the series was chiefly from the west, while that for the Appalachian system was chiefly from the east. The elevation took place at the close of the Triassic or in the early Jurassic period. Faults are frequent, and volcanic action became general, as shown by the numerous dykes which cut the series.

The crustal movements, however, over most of the region resulted in monoclinal uplifts of low angle. Flexures are rare and local, the largest being that of the Richmond Basin.

The Jurassic period was one of great denudation, when the high ranges of the Appalachians were much wasted away, and the newly-elevated Triassic beds were deeply eroded.

The brown sandstone of this series supplies one of our most valuable building stones.

COASTAL PLAIN.—At the close of the Jurassic period there was a slight elevation; but this was of short duration, and gave place to a strong eastward tilting of the land, which permitted the western transgression of the Upper Potomac formation.† The Potomac series was formerly classified as Lower Cretaceous by Davis‡ and others, but the very careful stratigraphic work of the Maryland

* U. S. G. S. Bull. No. 85, 1892; American Journal of Science, 1879.

† Physiography of Maryland, Part II., p. 144.

‡ The Geological Dates of Origin of Certain Topographic Forms. Geol. Society America, Bull. 11, 1890, pp. 545-548.

Geological Survey has led to the classification of the lower beds of the series to the Jurassic. The Coastal Plain Series begins with the Potomac Group*, which were formed in a narrow band along the Atlantic Coast. Detached portions of the beds indicate that they formerly extended farther westward. The different members of the Coastal Plain series were formed by alternate periods of elevation and depression. It is beyond the province of this discussion to enter into a detailed description of the geological history.

The series consists of sands, clays, loams and gravels, usually in the unconsolidated state, and arranged almost horizontally.

The Tertiary period was inaugurated by an encroachment of the sea, and the Eocene deposits of sands and clays formed in a narrow band through New Jersey, Maryland and Virginia. From Virginia southward the deposits become much broader. The crustal movements which closed the period were greater from south to north and from east to west, giving a southeast tilting. This is true for the whole Coastal Plain series, as evidenced by the thickness of the beds, and the resulting topography. One of the salient topographic evidences is the increase in the southeastward deflection of the streams along the western border of the Coastal Plain (along the "Fall Line").

The early Miocene witnessed a slight transgression of the sea, as a result of which the Upper Miocene beds were deposited on the Lower Eocene. By the close of the period the Atlantic and Gulf shores had attained almost their present outline.

A broad belt, extending from the Piedmont margin to the centre of the Coastal Plain, is covered by a mantle of Lafayette (Pliocene) deposits in the interstream area. These consist of clay, loam, sand and gravel, the latter being often ferruginous and cemented into a compact ironstone. The formation has an average thickness of about 50 feet.

With the close of the Tertiary the Atlantic Coast was raised about 100 feet in the Virginia portion. On passing from Piedmont to the Coastal Plain, the stream character changes abruptly from rapids, falls, and steep gorges, to meandering streams over a terrace-bound lowland. The terraces were formed by the flood-plain condition existing during the Pleistocene period.

The great number of bays and estuaries are of comparatively recent origin, having been formed by the gradual subsidence of the Coastal Plain region, by which the rivers were drowned in their lower course through the transgression of the ocean. The Susque-

* *Physiography of Maryland*, II, p. 121.

hanna River formerly entered the ocean east of Cape Henry, and the Potomac, James, York and Rappahannock were its important tributaries. The continued depression converted the lower Susquehanna Valley into the Chesapeake Bay, and embayed the mouths of the lower tributaries, making them tidal streams. Accomac and Northampton Counties became thereby separated from the mainland.

The effect was to make all of the important streams navigable in the Coastal Plain part of their course, and it gave to the State in the formation of Hampton Roads (estuary at the mouth of the James River) the finest American harbour.

The elevation increases from sea-level to 150 feet on the western border. From the surface configuration the land is commonly designated as *first* and *second bottom*, and the *ridge country*. The *first bottom*, where protected from the tide, is very productive. It is in this portion that most of the swamp and marsh lands occur, all of which are covered with a variety of swamp and marsh grasses, which are partially utilized for grazing. Wherever this has been reclaimed it is exceedingly productive, Dismal Swamp* being the most notable example. No survey or special study has been made of these wild lands, but there is no doubt but that hundreds of square miles could be reclaimed at a cost which would leave a wide margin of profit.

The *second bottom* is alluvial, as the *first*, and is the most valuable part of Tidewater. The subsoil is a dark red or yellow clay, with a moderate admixture of sand. The surface soils consist of sandy loams, which vary in colour and consistency according to the mineral and vegetable matter predominating. The *ridge country* has an elevation of 90 to 150 feet above sea-level. The soil is a light sand, easily eroded, and intractable to most methods of improvement. This section represents one of the most important economic problems in the State. Calcareous marls have proved very beneficial, and it is believed by some fertilizer authorities that most of the area can be brought into a state of at least fair productivity.

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Virginia.*

* Dismal Swamp marks the southern limit of the bog mosses (*Sphagnei*) which are common further north, and the northern limit of the dwarf palmetto.

CLIMATE AND BOUNDARIES OF VIRGINIA.

BY

G. T. SURFACE.

CLIMATE.

In speaking of the climate of any region we naturally think of the weather conditions which prevail during the different seasons. Temperature, pressure, humidity, absorption, radiation, winds, and currents are the determinant factors, all of which interact with infinite variations. Just as the chemist and physicist are unable to dissect and measure the smaller units of physical substances, so the climatologist is unable to measure the smaller units of climatic cause and control. We can, however, determine the larger units, and out of these construct logical groupings. These, when studied in relation to each other at regular intervals through a long period, indicate with a fair degree of accuracy what may be considered as *constants* and *variables*. It is thus that we arrive at the science of *climatology*. It is only within modern times that it has advanced to the stage of becoming really an economic science, which we are conservative in saying is but in its infancy.

The native wealth of any land area is determined largely by its climatic and geological environment. We are justified in affirming that Virginia holds an exceptionally favored position as to the harmony of these two wealth-determining factors, so that nothing is lacking, from the standpoint of natural essentials, for the largest and most economic development of its resources.

The effect of climatic influences on the social order is also not to be lost sight of, or underestimated. The leading psychologists and anthropologists attribute the wide differentiation of races to differences of geographic environment. Many of these designate climate as the controlling factor. Whether this may, or may not be true, we do know that climatic extremes do not conduce to the most efficient voluntary activity.

The climatic belts of the State are in general coincident with the physical divisions. There are limited areas, which, by virtue of their position, are subject to more sudden changes and greater extremes.

There are no high mountain ranges in the State, but the elevation is continuous from the Eastern Shore to the Blue Ridge. We see in Table I (p. 97) a difference of 10° in the mean annual temperature

of Norfolk and Burke's Garden, the latter being an observation station in Tazewell County. This difference would be even greater but for the tempering effect of the warm waters of the Gulf of Mexico on the prevailing southwestern winds. The rainfall varies somewhat with the seasons, but the general average for different years shows that no section can be said to be favoured above another. This average ranges between 35 and 45 inches. The rainfall of the Tidewater region would be considerably heavier than in the Blue Ridge, the Valley, and the Appalachia regions but for the re-saturation of the southwestern winds as they pass over the warm Gulf waters. Killing droughts and disastrous weather changes, such as are common to the region west of the Mississippi River, are unknown. In Texas we find a maximum difference in the mean annual temperature of 21.7° , and droughts are not infrequent in the northern and western portions of the State. Washington shows the widest range in the annual rainfall, Clearwater having an average of 126 inches and Mottinger Ranch an average of 11 inches.

The Alleghany Highlands, extending for a distance of 200 to 500 miles west of the State boundary, constitute an effectual barrier against the storms which originate in the Mississippi Valley region.

The mean average annual temperature for the whole State is about 56° .

Tidewater.—The climate of this coastal region has a mean annual temperature of 58° to 61° , being greatly ameliorated by the warm north-west currents of the Atlantic, whose waters intermingle off the Florida coast with the heated waters of the Gulf Stream as they emerge from the Gulf of Mexico, and flow thereafter as a north-east current along the eastern coast of the United States. The soil of this belt is universally sandy or a sandy loam and, with a limited rainfall, or cold climate, would be of little economic value. Having an adequate rainfall and a warm-temperate climate, it becomes ideally adapted to the profitable industry of trucking, and holds first rank in this line of production. Much of the arid land of the west has a similar soil, and as favourable temperature requirements, but is practically worthless for lack of rain supply or irrigating facilities.

The average growing season* is from 7 to $7\frac{1}{2}$ months' duration. The winters are short and mild; the snowfall usually light; and the freezing never extreme or protracted. The summer's heat is so tempered by the sea-breezes as to seldom become oppressive.

Malaria was common during the early Colonial days, but this has been largely exterminated by clearing the forests, draining the low-

* Average duration from the last killing frost in the spring to the first killing frost of autumn.

lands and swamps, and the removal of the residences to more sanitary locations.

The mean annual temperature of the extreme southern Tidewater Counties averages about 60° . It is in this belt that cotton is grown to a limited extent. The mean annual temperature decreases gradually within narrow limits as we pass northward. This results both from the more inland geographic position, and the difference in latitude. The heaviest rainfall registered in Tidewater is in the Richmond, Williamsburg, Pamunkey and Gloucester Peninsulas, this belt being northwest of the Chesapeake Bay mouth. Even in the Virginia coast region there is considerable seasonal variation in the amount of precipitation.

Middle-Piedmont.—The average mean annual temperature of this belt is 56° - 58° . Lynchburg is near the Middle-Piedmont boundary line, and Manassas is on the line. In 1900, the average for Lynchburg was 58.4° , and for Manassas 56.5° (in 1902 the average for Lynchburg was 56.8° , and for Manassas 54.1°). This climatic belt marks the area of the most successful tobacco culture. Tobacco is also cultivated with fair success in the mountain areas, with a mean annual temperature as low as 52 degrees.

The growing season of the Piedmont belt is 2 to 3 weeks shorter than in Tidewater.

There is greater variation in the prevailing direction of winds in this belt than exists in any other part of the State, because of its inland location with reference to both the mountains and the sea. The autumn winds are prevailing north-west, but those of the other seasons fluctuate, the east and north east being most common in the spring and summer. The northwest autumn winds are usually displaced by western winds in the early winter, which in turn give way to southwest winds before March.

Blue Ridge, Valley and Appalachia.—These regions constitute the mountain district of the State, in which the climatic differences so far as revealed by observation do not justify a differentiation. The mean annual temperature of the Blue Ridge and the Valley is 52° - 56° , and that of Appalachia is 48° - 54° . We may correctly designate this as the zone of grasses, grains, and apples. The average mean annual temperature not only increases as we pass from east to west, but also from north to south, since the elevation gradually increases from the Potomac River southward.

The aggregate precipitation of the mountain district does not differ materially from the Piedmont-Middle belt, but the proportion represented by snow is much greater; and the rains are more frequent

and of shorter duration. The rainfall also increases with the altitude up to a variable limit, which is fixed by the local conditions. The mountains not only cause the condensation of the vapour brought by the rain-bearing winds, but prevent this supply of moisture from being carried away again by the winds in dry, clear weather. The rainfall of the Valley is greatest along the base of the mountains, since the air, approaching the mountain, is forced to rise some distance from the barrier. Most of the rain is supplied by the south-east and southwest winds, the one directly off the warm Atlantic and the other less directly off the warmer Gulf. Those from the Gulf have been robbed of some of their moisture by the intervening land areas, but the increased elevation enables them to draw more effectively from the decreased supply. Equalization of distribution is established by the eastern half of the State having the advantage of ocean proximity, and the western half the greater elevation.

The duration of the growing season is $5\frac{1}{2}$ to 6 months in the Blue Ridge and Valley, and an average of 2 weeks less in the Appalachia country.

This region, together with the part of Piedmont adjacent to the Blue Ridge, is peculiarly adapted to apple culture. The most successful growers plant their orchards on the mountains, because the valleys are not only more subject to frost, but the winter temperature is lower than for the mountain, up to a greater elevation than is represented by the mountains of Virginia. It is for this same reason that the coffee plantations of Brazil are laid out on the high ground. This theory when first advocated was considered absurd. It is now no longer accepted as a theory but as a fact, having been demonstrated by the scientists of America and Europe. The explanatory cause is, the greater radiation in the valley. This is not necessarily more rapid, but of longer duration. It begins one to two hours earlier in the evening, and continues one to two hours later in the morning. The following we quote from Julius Hann:*

The Swiss have learned by experience that the mountain sides have far more favourable temperature conditions in late autumn and in winter than the lowlands. During one of the calm, clear spells of late autumn the traveller who spends a few days at one of these farm houses on the steep mountain side may there breathe air which has the mildness of summer; he may see the green fields still decked with autumn flowers . . . while down below, in the valley, the ground is already frozen hard by the frost, the trees are lifeless, and all the activities of plant life have long ceased.

There is a wide variation in the snowfall of the State, both regionally and seasonally. It is usually light and of short duration in Tidewater and Middle Virginia. From the Blue Ridge westward, however, it is not uncommon for the ground to be blanketed a period

* *Handbook of Climatology* (Ward's translation), p. 264.

of six weeks or two months. This is of great economic value to the grain and grass crops of the region, protecting them not only against the intense cold of January and February, but ameliorating the effect of the thaws of occasional warm days. Since the region under discussion includes most of the large forested areas of the State it is important that we make a brief study of the climatic effects of forests. Forests increase the absorption, and protect the contained moisture from speedy evaporation. This is most in evidence during a drought. When the fields are parched and dusty, scarcely showing signs of life, the adjacent forest has a wealth of foliage and flower. Throughout the areas that have been deforested during the last half century there is a noticeable decrease in the size of the streams. The ruins of old mills still remain on streams whose volume would now be entirely inadequate. The influence of forests on the distribution of water supply is greatest in connection with the snows and rains of the winter season. By preventing the snows from drifting and decreasing the melting, a forested area thereby holds the water until it can be assimilated by percolation and absorption. We do not insist that the aggregate rainfall has been materially lessened, but that the same rainfall in a deforested region cannot be so thoroughly assimilated. If the country is deforested the ground usually freezes several inches before it receives much snowfall, and, in consequence, remains frozen to a greater or less extent until the approach of spring. The frozen earth being almost impervious, causes the loss of most of the water by surface drainage. The natural result is that floods are far more frequent in deforested regions.

Forest soils have also that constituency and protection which appreciably decreases radiation. The old settlers recognized them as "warm soils," without having the knowledge of a scientific explanation. The inability to raise peaches in certain parts of Michigan with former success has been ascribed by some students of the question to the deforestation of the country.

GENERAL REMARKS.

The climate of Virginia is ideally adapted to successful agriculture, since the prevailing conditions in the different geographic divisions are such as are best suited to the soils of those regions. If the Blue Ridge and Tidewater could exchange positions, Virginia would cease to supply the eastern markets with early vegetables, and, instead of an annual surplus of more than \$10,000,000, would be but little more than self-supporting. Then, if Appalachia could ex-

change places with Piedmont, Virginia would cease to be an important tobacco-producing State, and the net receipts from this resource alone would be decreased by at least \$5,000,000 per year. The rainfall has the most advantageous monthly distribution with reference to farming operations and the growth of crops, being somewhat heavier from April to July, which makes disastrous droughts unknown. The growing season of each section is always long enough to mature the standard crops of that section.

In general healthfulness, probably no State in the Union is more favored. The coastal region is growing in importance as a winter resort, and the western part of the State has for many years been a Mecca for summer tourists who seek health and comfort. The popular resorts are to be found in almost every county west of the Blue Ridge.

MEAN ANNUAL TEMPERATURE, RAINFALL AND SNOWFALL, AND
LENGTH OF GROWING SEASON,

1900-1905.

FOR REPRESENTATIVE VIRGINIA STATIONS.

						ANNUAL			KILLING FROST		ANNUAL	
STATION.	NAT. DIV.*	JAN.	APR.	JUL.	OCT.	MEAN.	EXTREME MAX.	MIN.	LAST IN SPRING.	FIRST IN AUTUMN.	RAINF. INCHES.	SNOWFL. INCHES.
TABLE I, 1900:												
Norfolk	T	42.	45.5	80.9	65.8	60.7	100	13	Mch. 22	Nov. 10	39.34	7.3
Richmond,	P-T	39.4	57.3	81.2	64.6	59.7	102	10	Apr. 5	Nov. 10	37.76	15.1
Farmville	P		57.6	80.6	64.4		105		Apr. 14	Nov. 6		9.
Lynchburg,	P	37.6	57.1	78.6	63.3	58.4	100	9	Mch. 22	Nov. 10	47.10	7.2
Staunton	V	37.4	54.3	77.1	61.	56.9	102	2	May 10	Nov. 9	39.02	
Clifton Forge,	A	31.8	50.5	74.6	63.	55.1	100	6	Apr. 15	Nov. 6	37.91	
Blacksburg	V	35.7	51.2	71.4	57.3	52.9	96	-2	May 10	Oct. 18	43.75	20.5
Manassas	P	35.0	53.6	78.8	60.7	56.5	99	2	Apr. 15	Nov. 9	31.07	4.5
Burkes Garden,	A	31.3	48.9	67.9	54.0	50.1	89	-6	May 5	Oct. 10	41.85	38.0
Bigstone,	A	35.2	55.2	75.2	63.4	56.3	95	-4	May 11	Nov. 5	48.9	20.5
TABLE II, 1901:												
Norfolk	T	41.2	52.0	81.0	61.0	58.5	100	16	Mch. 8	Nov. 11	42.61	11.5
Richmond	P-T	38.8	52.8	81.0	59.1	59.2	99	9	Mch. 17	Nov. 6	42.05	15.8
Farmville	P	39.0	53.6	82.2	57.4				Mch. 30	Oct. 26		11.0
Lynchburg	P	38.3	51.9	80.0	57.0	55.7	97	8	Mch. 18	Oct. 26	54.81	10.3
Staunton	V	37.6	50.0	78.2	56.8	54.1	96	1	Apr. 12	Oct. 30	51.18	
Charlottesville,	P	37.8	51.8	79.0	59.4	55.4	97	7	Mch. 12	Oct. 12	65.29	15.5
Blacksburg	V	33.0	45.2	74.0	52.0	50.0	92	0	Apr. 12	Oct. 4	53.46	20.3
Wytheville	V	35.1	47.0	75.4	54.7	52.2	95	0	Apr. 12	Oct. 8	62.65	
Burkes Garden,	A	31.8	42.4	70.4	48.4	47.6	88	-14	Apr. 29	Sept. 21	63.71	
Bigstone Gap,	A	35.4	49.0	76.5	54.9	53.3	95	-5	Apr. 24	Oct. 4	55.77	28.8
TABLE III, 1902:												
Norfolk	T	37.4	56.0	79.6	64.2	59.3	98	18	Mch. 19	Dec. 6	38.4	0.1
Richmond	P-T	36.2	55.8	79.0	61.6	58.2	98	15	Mch. 7	Oct. 30	49.32	2.2
Farmville	P	33.6	54.8	80.7	59.6		101	4	Mch. 21	Oct. 22		
Lynchburg	P	34.2	54.8	78.5	59.0	56.8	99	13		Oct. 30	48.79	2.1
Staunton	V	33.8	52.4	76.3	58.4	54.9	99	9	Apr. 16	Oct. 15	38.19	
Clifton Forge,	A	28.0	47.7						Apr. 20			
Blacksburg	V	30.5	49.0	72.5	55.1	52.4	95	5	Apr. 18	Sept. 14	33.73	6.
Manassas,	P	33.5	50.0	77.0	58.6	54.1	103	0	Apr. 20	Oct. 22	36.85	
Burkes Garden,	A	29.0	44.7	67.6	50.7	48.5	87	0	Apr. 18	Sept. 14	43.95	11.0
Bigstone Gap,	A	33.4	52.2	74.2	57.6	55.1	94	6	Apr. 13	Oct. 15	48.06	

* Tidewater (T), Piedmont (P), Valley (V), and Appalachia (A).

MEAN ANNUAL TEMPERATURE, ETC.—Continued.

						ANNUAL			KILLING FROST		ANNUAL	
STATION.	NAT. DIV.*	JAN.	APR.	JUL.	OCT.	MEAN.	EXTREME MAX.	MIN.	LAST IN SPRING.	FIRST IN AUTUMN.	RAINF. INCHES.	SNOWFL. INCHES.
TABLE IV, 1903:												
Norfolk	T	41.2	58.0	78.7	60.6	59.0	97	14	Apr. 5	Oct. 28	46.10	15.2
Richmond	P-T	38.2	57.8	79.3	58.9		93	7	Apr. 24		47.42	20.4
Farmville	P	38.2	55.4	78.9	57.8		.99	12	May 3	Oct. 26		
Lynchburg	P	36.6	56.1	77.6	58.0	56.4	96	8	Apr. 5	Oct. 27	41.24	14.6
Staunton	P	34.6	54.5	74.2	57.1	54.4	95	-5	May 2	Oct. 25	45.63	
Rocky Mount	P	33.4	52.6	71.2	53.2		89	7	Apr. 6	Oct. 27	49.61	
Blacksburg	V	32.5	50.5	71.8	53.2	51.2	91	-1	May 2	Sept. 29	44.76	20.0
Burkes Garden	A	29.7	47.2	66.8	48.8	48.1	86	-6	May 5	Sept. 19	46.22	28.0
Manassas	P	33.0	53.1	75.8	56.6		96	2	Apr. 6	Oct. 27		
Williamsburg	T	35.8	56.2	78.0	57.8	56.9	98	9	Mch. 4	Oct. 27	49.24	
Bigstone Gap...	A	39.0	54.3	74.0	55.2	55.1	94	-3	Apr. 24	Oct. 19	46.8	20.9
TABLE V, 1904:												
Norfolk	T	36.4	55.4	77.2	59.6	57.4	94	12	Mch. 29	Nov. 7	42.6	12.2
Richmond	P-T	33.4	54.2	77.7	57.7	56.2	98	9	Apr. 20	Oct. 28	37.84	19.0
Farmville	P		52.8	78.0			98		Apr. 21			
Lynchburg	P	32.8	52.2	75.6	56.2	54.8	98	3	Apr. 22	Oct. 4	26.87	19.2
Staunton	V	30.3	50.0	72.5	55.7	52.9	95	-4	Apr. 22	Oct. 7	28.84	
Wythville	V	28.8	46.5	69.4	51.8	50.7	89	1	Apr. 22	Oct. 15	24.38	19.9
Blacksburg	V	29.	46.6	69.4	52.4	50.3	91	-3	May 16	Oct. 15	32.25	26.0
Charlottesville	P	31.8	52.8	75.1	58.6	55.3	90	4	Apr. 22	Oct. 7	30.37	21.0
Burkes Garden	A	26.2	44.1	64.4			85	-14	May 11	Sept. 16	39.59	29.0
Bigstone Gap...	A	32.5	51.1	71.8	55.3	54.3	92	5	May 17	Oct. 24	39.06	30.2

* Tidewater (T), Piedmont (P), Valley (V), and Appalachia (A).

GEOGRAPHIC AND POLITICAL BOUNDARIES.

Five natural geographic divisions can be easily recognized in a study of the physical features and climatic belts of the State. These have a general northeast and southwest direction, as fixed by the Atlantic coast-line on the east, and the Appalachian System on the west.

NATURAL DIVISIONS.

		AREA IN SQUARE
		MILES.
1.	Tidewater	11,000
2.	Middle	12,000
3.	Piedmont	6,000
4.	Blue Ridge	2,500
5.	Valley	5,000
6.	Appalachia	5,400

These divisions succeed each other in parallel order, and are characterized by a continuous increase of elevation from the sea westward.

Tidewater.—As the name would indicate, this represents that portion of Virginia territory which constitutes a part of the Coastal

Plain. It is an irregular quadrilateral in shape, averaging 114 miles in length from north to south, and 90 miles in width from east to west, and includes an area of about 11,000 square miles. On the south it borders North Carolina for a distance of 104 miles; on the east it is bounded by 1,500 miles of tidal shore-line on the Atlantic Ocean, Chesapeake Bay, and the Lower Potomac River, or one mile of shore to every $71 \frac{1}{3}$ square miles of territory. The continent of Europe has one mile of shore-line to every 191 square miles. The western boundary is marked by that line of sudden topographic change known as the *fall line*, where the streams emerge from the hard crystalline rocks of Piedmont on to the soft sedimentary deposits of the Coastal Plain. The great number of bays and estuaries are of comparatively recent origin, having been formed by the gradual subsidence of the Coastal Plain region.

The political boundary lines of Virginia are generally irregular, but they are more irregular in Tidewater than elsewhere, since the boundaries of the older counties were almost without exception fixed by the streams and the Chesapeake Bay water front.

Middle Virginia.—In the article on physiography this territory was grouped as a part of Piedmont because of the similarity of structure and the inability to so clearly differentiate it physiographically from the Piedmont proper. However, in the early development of the country the barriers which constitute its irregular western border were sufficient to give rise to a fairly well-defined differentiation of population. It is for this reason that we describe it here as a geographic division.

It extends westward from the head of tide ("fall line") to the foot of the low, broken ranges, Catoctin, Bull Run, Yew, Clark's, South-west, Carter's, Green, Findlay's, Buffalo, Chandler's, Smith's, etc., mountains and hills. These extend across the State in a south-west direction from the Potomac River, near the corner of Fairfax County, to the North Carolina line, and are a part of the eastern outliers of the Appalachian System. The general form of this area is that of a right-angled triangle, its base resting on the North Carolina line; its perpendicular a line 174 miles in length, extending from the North Carolina line to the Potomac River; and the hypotenuse, 216 miles in length, extending along the Piedmont border. Most of the streams cross it at right angles, dividing it into a series of ridges. On the whole, it has the appearance of an undulating plain. A triangular area, including a part of Fauquier, Fairfax, Culpepper, and Madison counties, consists of Triassic-Jurassic sandstone, which produces a residual soil of marked fertility and durability.

Piedmont.—This division extends from the Appalachian outliers, previously named as the irregular western border of Middle Virginia, to the eastern base of the Blue Ridge. It varies in width from 20 to 30 miles, and extends from the banks of the Potomac to the banks of the Dan River on the North Carolina line, a distance of 244 miles. The elevation increases from 300-500 feet on the east, to 700-1200 feet along the Blue Ridge border. The topography is much broken by the numerous streams which cross it almost at right angles.

From the middle of the 17th Century to the middle of the 18th Century this region constituted the Virginia frontier, which gave rise to a very distinct type of society.

Blue Ridge.—This is the most prominent physical feature in the State, and stands as a conspicuous barrier between the Piedmont and Valley regions. It is 3 to 20 miles in width. Its elevation at Harper's Ferry, where the Potomac breaks through the Ridge, is 1,460 feet. This increases southwestward, reaching its maximum in Rogers Mountain, Grayson County, which is 5,719 feet in elevation. In its southern portion it expands into a plateau, which is the watershed for the waters which flow into the Gulf of Mexico and the Atlantic Ocean. This fan-like expansion includes the counties of Floyd, Carroll, Grayson, and parts of Franklin and Montgomery.

The early colonists gave it the name of the "Blue Mountain," or the Blue Ridge, from its appearance in the distance. During the first half century of colonization the inhabitants believed it was impassable; and the first explorers to ascend it did so only to find other heights as formidable in appearance looming up in the west, and turned back in discouragement. In the spring of 1669 John Lederer* made a trip to the top of the Blue Ridge, which he called *Apalataei*. Almost the whole of the plateau is drained by New River, which flows northeast through a gorge valley of circuitous winding, having established its course at a stage of advanced erosion, when the whole Appalachian area was reduced to a peneplain.

The Valley.—This division is 15 to 30 miles in width and 310 miles in length, making an area of about 5,000 square miles. It consists of a continuous chain of counties, the boundary of which is fixed by the Blue Ridge on the one side and the second and third range west of the valley on the other. Prior to 1738 all that part of Virginia situated west of the Blue Ridge was included in the County of Orange, but in the fall of 1738 this territory was divided into the counties of Frederick and Augusta.

* Discoveries of John Lederer in Three Marches from Virginia, p. 11.

Appalachia.—This is the most irregular of the natural divisions both in boundary and physical features. The eastern boundary is in general formed by Walker, Brush, and North Mountains; while the western is formed by the Cumberland, Black and Flat Top Mountains south of the New River divide, and by the Alleghany Mountains or the Alleghany Front north of the divide.

This irregular belt is 260 miles in length and 10 to 50 miles in width, with an approximate area of 5,725 square miles.

The counties can be provisionally grouped with reference to their drainage system as follows:

1. *James River Group*, including Highland, Bath, Alleghany and Craig Counties.
2. *Kanawha or New River Group*, including Giles and Bland Counties.
3. *Tennessee River Group*, including Tazewell, Russell, Lee and Scott Counties.
4. *Sandy River Group*, including Buchanan and Wise Counties, which topographically belong to the Alleghany Plateau region.

SUMMARY OF STATE BOUNDARIES UNDER DIFFERENT CHARTERS AND NEGOTIATIONS.

- 1606.—First Charter* under James I, including all territory 100 miles from the coast, between 34°-45° N. Latitude, and all the islands adjacent thereto.
- 1609.—Second Charter, known as "Virginia Charter of 1609," including 200 miles along the seacoast northward and southward "from the said point of Cape Comfort," "through from sea to sea," and all islands adjacent thereto.
- 1611-1612.—Third Virginia Charter, including all territory between 30°-41° North Latitude.
- 1632.—Maryland is detached, but the separation is strenuously opposed by the Virginia colonists.
- 1744.—Virginia obtained from the Six Nations a deed for all their territory, which had for its boundary on the west and north-west the Mississippi and Illinois Rivers; thence along the east side of Lake Michigan, including Lake Huron; thence to the Ottawa River, which it followed to its junction with the St. Lawrence River; thence to the head of Lake Champlain; thence on the 45th parallel to the St. Lawrence River; thence to Lake Ontario; thence with the Lake shore to the western Pennsylvania boundary."†

* Jamestown was settled under this charter.

† *Colonial Boundaries of Virginia and Maryland*, Gilbert Thompson, pp. 8-9.

From this time the boundaries remained unchanged until the settlement of the national boundaries by the cession of 1783, in which, on October 20, the General Assembly passed an act authorizing the delegates in Congress to convey to the United States all the Territory northwest of the Ohio River.*

1862-3.—The territory now constituting the State of West Virginia† was by the vote of the people separated from Virginia. It consisted of the three Northwestern Virginia Senatorial Districts.

* American History Leaflet No. 22. By Hart and Channing. p. 12.

† Constitution framed November, 1861–February, 1862, and ratified by the popular vote in April, 1862. Bill for the admission of the state passed the United States Senate July 14, 1862. State formally inaugurated June 20, 1863.

The Rending of Virginia. G. D. Hall. pp. 26–27.

RACIAL AND REGIONAL STUDY OF THE VIRGINIA POPULATION.

BY

G. T. SURFACE.

The distribution of population in a new or old country affords an essential key for determining the factors of geographic control and economic response. In this brief discussion we cannot hope to do more than point out some of the salient facts relative to the establishment, evolution, and distribution of the people of Virginia.

The Indians, who were in possession of the territory prior to colonization, divided themselves into three confederacies—the *Powhatans*, *Mannahoacs*, and *Monacans*. The Powhatan confederacy occupied the Coastal Plain region and southern Piedmont, and consisted of 30 tribes; the tribes inhabiting the headwaters of the Potomac and the Rappahannock Rivers were attached to the Mannahoacs; while those of the headwaters of the James River and the Great Valley belonged to the powerful Monacans. The territory of the Monacans was always referred to by the eastern tribes as "the stony region." From this we see that the aboriginal people were distributed and divided according to distinct economic and physiographic conditions. The tribes of the three confederacies spoke languages so radically different that interpreters were necessary for the transmission of communications. Each was as distinctly adjusted to his primitive environment as was the Cavalier, the small German farmer, and the Scotch-Irish mountaineer of a century later. The Powhatans and the Monacans were naturally the most densely-populated because their food supplies were both more abundant and more accessible, and the density in any local area was in direct proportion to the ease with which a livelihood could be obtained. Captain John Smith estimated, in 1609, that there were 5,000 Indians within 60 miles of Jamestown.

The only vestige of Indian blood remaining which can be identified with any degree of certainty is that of two small reservations in King William County, and these are considerably more negro than Indian. The larger band numbers 120, and they call themselves

Pamunkies; the smaller numbers about 50, and they call themselves *Mattaponies*. They are both governed by chiefs and councillors, together with a board of white trustees chosen by themselves. That they can lay some claim to being descendants of Powhatan may be inferred from Thomas Jefferson's reference to the *Mattaponies* and *Pamunkies* still occupying, in 1787, small holdings in King William County, on the streams bearing their names.*

Most of the Virginia colonists of the 17th Century were *English*. Of these a small minority were of the English gentry, while the free and indentured † servants constituted the vast majority. Though these classes were of the same race, they were as widely separated in point of ability and social standing as if they had belonged to different races. They came for the most part from southwestern England, many being from the city of Bristol, and settled on the Coastal Plain and along the eastern border of Piedmont. The Cavaliers did not come in large numbers until after 1649. By 1790 they were estimated to number 250,000 and to represent the majority of the free whites. That almost all of them became planters, and became political and social rulers, is so well known as not to demand a discussion.

The *Quakers* began to make their appearance in 1656, and the first immigrants settled in Nansemond County. As the agitation against them increased, some of them moved to the western Piedmont and Valley region; but they continued stronger in the south-eastern portion of the State than they became elsewhere.

Small parties of *French Huguenots* were introduced in the early part of the 17th Century for the purpose of planting vineyards and conducting that industry, but their coming was not fostered by the Government until 1700. In this year Colonel Byrd ‡ negotiated for the landing of 500 Huguenot refugees, who were distributed as follows, according to Brock:§ "They appear to have settled at different points; a portion about Jamestown, some in Norfolk County, others in Surrey, and 200 or more at a point some 20 miles above Richmond, on the south side of the James River (Powhatan County), where 10,000 acres of land, which had been occupied by the extinct Mannakin tribe, was given them." This settlement was made a distinct parish by an Act of the Assembly, December, 1700. They were accepted as desirable foreign immigrants because they accepted as a class the religion of the Established Church. The

* Lecky—England in the 18th Century, Vol. 3.

† Servants bonded for a time service to pay for transportation.

‡ Lecky—England in the 18th Century, Vol. 3.

§ R. M. La Follette. The Making of America, Vol. 1, p. 16.

Huguenots were the most intelligent and enterprising Frenchmen of the 17th Century. Many were merchants and manufacturers, and few belonged to the French peasantry, or wage-earning class. Henry Cabot Lodge has attempted to differentiate the American "notables" according to race. He finds that 589 of the 14,243 listed in Appleton's Encyclopedia of American Biography are of Huguenot descent, which would indicate on that basis of comparison a percentage of ability higher than that of any other race. The immigrants to America being largely a select class of tradesmen and artisans, combined with the readiness with which they assimilated the language and religion, gave them a special opportunity for advancement.

The German immigrants during the early colonization of Virginia are usually spoken of as "skilled workmen of the trades," but their immigration did not assume important proportions until after the beginning of the 18th Century. About this time they began to come in large numbers as an overflow from Pennsylvania, where the policy of William Penn was so favourable that more than 500,000 came to that State in 20 years. As a class they were poor, and those who came from England were religious refugees. The land of the eastern part of the State was occupied, and the attitude of these English colonists was anything but generous to *separatists* of any class. The presence of a frontier protection barrier was, however, so desirable as to make their presence in the western part of the State tolerated. Here land was cheapest, and the Great Valley gateway opened directly into it, so it was but natural that the Germans settled chiefly in the Valley and the western Piedmont counties. It is in this region that we find their descendants in large numbers to-day; and they are, as a rule, industrious, thrifty, frugal, and pious.

More *Scotch-Irish* settled in Virginia in the 18th Century than any other class. This is a mixed race, made up of the primitive Scot and Pict, the primitive Briton, the primitive Irish, but with a larger admixture of the later Norwegian, Dane, Saxon, and Angle. The discriminatory trade laws passed by the Irish Parliament in 1698 destroyed their industrial prospects; and the Test Act of Queen Anne's Parliament, compelling public officials to take the communion of the Established Church, deprived them entirely of self-government. With this they began to migrate in large numbers. They found in Massachusetts a State church to which they must conform to be admitted to citizenship; the Dutch of New York were unfriendly to them; the Germans were localized and in possession of eastern Pennsylvania and Maryland; and the English held eastern

Virginia. In consequence, the great majority went west into central and western Pennsylvania, and southward through the Great Valley into the frontier country of Virginia, on into east Tennessee and western North Carolina. So favourable were the geographic conditions that they became the dominant class in the Valley. While the planters of eastern Virginia were living in luxury and ease, with an abundance of time and ambition for political and social pursuits, these hardy immigrants were building houses, clearing forests, tilling the soil, and fighting the ever-menacing Indians. They were brave, brawny, resolute, robust, and industrious. Their experiences in Scotland had been such as to make them brave and self-reliant, and appreciative of the conditions of freedom.

Much of this 18th Century frontier region has, under the touch of skill and civilization, become the garden spot of the State, with the largest wealth *per capita* of any section in the State; but many of the communities are the direct descendants of the first settlers, with scarcely a trace of foreign admixture, and are probably the purest stock in America.

The *Italians* did not become an important part of Virginia immigration until within the past three decades, but are coming now in larger numbers than any other race. Two causes explain this unusual influx: first, the immense Italian immigration to America—200,000 per year; and, second, the unprecedented industrial activity of the State, such as railroad construction, mineral development, and factory enterprises. Most of them are from southern Italy, where the agricultural wages are from 8 to 32 cents per day. They command in Virginia \$1.25 to \$3.00 per day in mining, and \$1.50 to \$3.00 per day in railroad construction. They are the most migratory of our foreign constituency. They are also the most illiterate, the most subservient to superiors, and yet among the most thrifty and industrious of our common labourers. Their standards of living are naturally low, the majority being of the peasantry who have fled from poverty, congested population, and the oppression of the landlord system. We get very few immigrants from northern Italy, which has that intellectual, educated, and progressive type, so well demonstrated in their development of the Argentine Republic. In Buenos Aires they constitute one-third of the population, and own one-half of the commercial capital of the city.

The *negro* population of the State is undergoing a rapid readjustment in aggregate and territorial distribution. According to the 1900 Census, there were 55,000 negroes to every 100,000 whites, as compared with 62,290 to each 100,000 whites in 1890. The white

population increased 16.9 per cent. in the last decade, while the negro increased but 4 per cent. The negro population in the different geographic divisions is distributed as follows in the order of density: Piedmont, Tidewater, the Valley, Appalachia, and the Blue Ridge.

The migration is taking place in four directions: from the State as a whole to northern and eastern cities; from the non-mining districts to the mining districts; from the country to the cities and towns of the State; and from the mountains to the valleys. The population was never large in the mountain sections, but almost all of the few thousands who lived in the mountains have moved out. More than 30 per cent of the total coloured population live in cities and towns, while less than 20 per cent of the white population is urban. The relative decrease in the population is attributed to the high death-rate, and the northern migration—chiefly to Washington, Baltimore, Philadelphia, and New York. The census returns from ten southern cities gave the coloured death-rate at 30.5 per 1,000 coloured persons, while for the whites it was 17.9 per 1,000 in the same cities. The coloured infantile death-rate is nothing less than appalling—371 deaths to 1,000 children born, as compared with 148 among the whites. The coloured death-rate from tubercular trouble is more than two and one-half times as great as among the whites. What statistics we have on this subject for the years 1820 to 1850 indicate that the coloured death-rate from this cause was less than that of the whites. The causes are too numerous for a full discussion in this paper. The most apparent are—the change from an open-air country life to congested city life, prevalence of immorality and vice, ignorance of the laws of health, lack of medical attention, and the lack of institutions for antagonizing disease. The economic safety of the white population and the rescue of the negro from physical degeneration demand that the situation receive prompt and vigorous attention at the hand of the Government (State and Federal), of all institutions organized for the purpose of safe-guarding the interests of humanity, and of every citizen and individual who prizes the health of his own family as worthy of protection.

As a factor in the labour situation, the negro is important; but it is difficult to predict his economic future. In Virginia he is drifting rapidly away from agriculture, is generally unsatisfactory in factory service, and many are developing such a marked aversion to domestic service as to be willing to live in poverty rather than engage in it. In whatever service engaged he is irregular, but, notwithstanding this serious objection, is generally considered as the most

satisfactory labourer in construction work and mining operations. The same may be said of his services in restaurants and hotels.

* * * * * * *

Population statistics supply at least a partial gradient for reading the economic and social conditions underlying them. During the decade 1890-1900, the general population of the State increased 16 per cent., the rural population a little less than 12, and the urban population 22.7. As a rule, economic factors are predominant in the shifting and readjustment of population; but in the case of the negro social factors seem to be of paramount importance. Since each natural division of the State has its own distinct economic environment, it will be interesting to examine into the human response as expressed by the redistribution which is in progress. The average increase in Tidewater was (1890-1900) 14.1 per cent., this being exclusive of incorporated towns. This evidences a normal healthful growth in the development of agriculture, which is the only rural source of wealth.

Passing to Piedmont, the population curve rapidly descends to an average increase of 4.3 per cent. How shall we explain the relative decrease? In six counties within 60 miles of Richmond there was an absolute decrease, the result of city migration for more lucrative employment than the worn and frequently sterile soil can realize, better educational and religious advantages, and the purchase of country real estate by city investors.

There are only three counties which are situated wholly in the Blue Ridge division: Floyd, Carroll, and Grayson. These are rugged plateau counties, which until recently were 20 to 30 miles from railroad connection, and in consequence are devoted entirely to agricultural pursuits. The population increased in the past decade 16.1 per cent. From a careful field survey of this region I am convinced that the large increase is due to the prevalence of large families. The small family is in that region the exception.

The Valley has had a normal healthful growth, with an increase of 13.5 per cent. This is the most productive agricultural region of the State. It has for many years been served by a railroad line throughout its length. The productivity of the soil, proximity to shipping points and small towns, and a native population trained to labour with the hands have minimized the tendency toward urban migration.

Appalachia has been the scene of the most phenomenal development, chiefly through the growth of the coal and iron industries. The average increase in population 1890-1900 was 29.9 per cent.,

and the increase since 1900 has been even greater. Wise County showed an increase of 110.3 per cent.; Allegheny, 75.9 per cent.; Buchanan, 65.2 per cent.; and Dickenson, 52.6 per cent.

* * * * *

Of the total population engaged in some gainful occupation (536,883), 45.4 per cent. are engaged in agriculture, as compared with 51.5 per cent. in 1880; 15 per cent. in domestic and personal service; 14.1 per cent. in manufactures and mechanical pursuits; 11.2 per cent. in trade and transportation (as compared with 6.4 per cent. in 1880); 2.5 per cent. in professional service; 1.4 per cent. in fishing; 1.1 per cent. in mining and quarrying; and the remaining 9.4 per cent. in sundry vocations.

VIRGINIA TRADE AND COMMERCE.

BY

G. T. SURFACE.

Excepting the complicated factor of human traffic, the commercial relations in Virginia under slavery were surprisingly simple, as compared with the social ideals and customs of the time. The explanation for this is manifest, in that the large labour surplus enabled the owners to be producers of most of the articles consumed, and at the same time produce a large surplus of tobacco, the most profitable commodity in the export trade. In 1790, Virginia ranked first in the total value of exports (\$3,131,865). By 1830 the export trade had increased to \$4,791,644; while for the same year the imports only aggregated \$405,739, showing how adequately the demands were met by the home manufacturers.

The passing of the War crisis, with its destruction to life and property, and the emancipation of slaves, made necessary a new system of production, which in turn brought about a reactionary adjustment of Virginia's commercial relations. The decade following the Civil War is the period which marks the beginning of a new era in the industrial and commercial development of the State. We shall, therefore, discuss briefly the factors which gave impetus and foundation to the succeeding order. The immediate and most urgent demand was to become self-sustaining, by the production of food-stuffs and clothing, since all of the surplus had been consumed during the four-years' struggle, which centred on Virginia territory, and from which the people of the State suffered most. Co-ordinate with this was the demand for restoring the property losses incurred. Notwithstanding the fact that thousands of negroes migrated to the cities of the North and the cotton fields of the South, there was still

a surplus of negro labourers, but thoroughly disorganized and demoralized; and few of the landowners had the capital with which to employ labour. Capital far in excess of the surplus had been invested in negroes, so that bankruptcy was more general than surplus capital. The large tobacco surplus was, therefore, ruled out by the conditions at home, and a diversified agricultural production on a small scale made necessary. This initiative was promoted and fostered by conditions outside of the State. Cotton rose to fabulous prices, and in the cotton States all energy was bent to a maximum production. They could not afford to raise poor corn and wheat crops on good cotton land, when cotton was selling at fifty to sixty cents per pound. There developed, in consequence, a great demand for provisions in the cotton States. The border States—Virginia, Tennessee, and Kentucky—were adapted to grains, grasses, and the live-stock industries, but not to cotton. The stimulus for diversified agriculture in these States was therefore much intensified by the situation in the cotton States. But the situation in the North was no less favourable toward this same development. While the South had been purchasing negroes and growing negroes, the North had been building factories, extending trade, and accumulating a large surplus. As the war progressed prices rose and Northern industries flourished, as a result of which there was more money in the North at the close of the war than at the beginning. Following the war the demand for cotton and woollen goods, farming implements, and labour-saving machinery was unprecedented, and so the Northern factories entered upon a new era of development and prosperity, which rapidly increased the urban population. As a result, instead of the manufacturing States having a surplus of food-stuffs, they could scarcely supply the home demand.

Without discussing the beneficial effects of emancipation upon the production and trade of the State, it must be apparent to every student of Virginia's economic and industrial development that the change in the system was most fortunate. It induced an unwonted economy, which of itself was a discipline of far-reaching importance; discontinued the general practice of wholesale timber destruction; labour-saving machinery was purchased; the soil better cultivated; the property improved; the children schooled; and the surplus gradually increased.

Virginia is just now entering upon another era of industrial development, which may be characterized as the *era of scientific agriculture and diversified manufacture*. This was made possible by the sounder and more economic bases of the *post-bellum* policies.

We shall discuss the present trade conditions under the following divisions: Intra-State Commerce, or the sale and exchange of products between different sections of the State: Inter-State Commerce, the trade relations with other States; and Foreign Commerce.

INTRA-STATE COMMERCE.

REGIONAL.*—The distinct zones of production conform in general to the natural geographic divisions.† *Tidewater* produces a large surplus of garden products, peanuts, fish, and oysters, and these are the most important shipments westward; but they are more than balanced by the coal, lumber, hay, grain, and tobacco received from the western part of the State for home consumption.

Piedmont‡ produces a smaller surplus proportional to its area than either Tidewater or the Valley, but its productions are so varied that the deficiency of one part of the region could be supplied from the surplus of another, if developed with reference to economic adaptation. Coal from Appalachia is the most important shipment into Piedmont. Tobacco§ constitutes the largest surplus of southern Piedmont, and live-stock the largest of northern Piedmont. Fully three-fourths of the total tobacco crop is manufactured within the area. The important manufacturing and distributing points are Richmond,|| Petersburg,|| Lynchburg, Danville, Chatham, and Martinsville.

The trade of *Blue Ridge* consists chiefly of the sale of live-stock, lumber, and fruits; and the purchase of furniture, groceries, clothing, and machinery. This plateau section has more live-stock** per square mile than any of the other geographic divisions.

The *Valley* produces a large surplus of grain, hay, live-stock, winter vegetables, and fruit. A large part of the provision surplus of the southern Valley is marketed in the mining districts of Virginia-West Virginia, which is contiguous territory. There is still a small surplus of forest products, but the cultivatable land is being rapidly

* Production and trade of cities will be considered under a separate head.

† The natural geographic divisions of the State are Tidewater, or the Coastal Plain; Piedmont, or the plateau region; the Blue Ridge; the Valley; and Appalachia.

‡ Middle Virginia is here considered as a part of Piedmont.

§ Sixteen counties in Piedmont produced, in 1900, more than 3,000,000 pounds each. Pittsylvania ranked first, 17,088,550 pounds; Halifax second, 13,077,200 pounds; and Mecklenburg third, 7,368,220 pounds.

|| On the Piedmont-Tidewater boundary.

¶ Floyd, Carroll and Grayson are the only counties situated wholly in this division.

** Cattle, 33 per square mile; sheep, 46.3 per square mile (1900).

deforested, and cannot be reckoned as an important and permanent factor of trade.

The wealth of the Valley is greater *per capita* than is that of any other division, which makes it a large purchaser of farming implements, household furniture, and general merchandise.

Appalachia produces a large surplus of coal, coke, lumber, and live-stock. The coal is shipped to all parts of the State. The cattle are marketed locally, in the eastern cities, and as exports. Tazewell, Russell, Craig, Bland, and Giles counties form the agricultural belt of Appalachia, by virtue of a large part of the area having a strong residual limestone soil. Live-stock—especially small cattle and sheep—and lumber are the important sources of revenue in northern Appalachia.

The mining counties—Wise, Russell, Buchanan, Dickenson, and Lee—are large purchasers of provisions, merchandise, mining machinery, draft horses, and alcoholic drinks.

CITIES.*

Since no separate record of the State and inter-State traffic is kept, it is impossible to give figures as to the exact amount of shipments from the manufacturing and distributing points. The discussion is, however, based upon a careful study of the inter-State and foreign trade, reports and statements from the various Boards of Trade, and personal observations in representative sections.

Richmond ranks first in population; is served by more railroads than any other point in the State; is largest manufacturing, jobbing, and distributing centre; and is the most centrally located† city in the State. There were 1,554 factories in operation in 1906, the sales of which aggregated \$77,432,692. Of the manufactures, tobacco led with 59 factories, and a total product of \$20,195,336. The following valuations are given for the respective classes of manufactures: Iron products (including farming implements), \$9,876,482; fertilizers, chemicals, iron and cement products, \$8,376,120; and leather products, \$3,361,077. The jobbing trade for 1906 aggregated \$61,524,275. All of the important articles of manufacture are sold throughout the State.

The largest purchases made by the city consist of tobacco, lumber, grain, flour,‡ leather, vegetables, and poultry products.

* This part of the discussion relates only to the *intra-state trade* of the cities.

† If we draw a circle around Richmond as the centre on a radius which will include Accomac County, this circle will include four-fifths of the total Virginia territory.

‡ The Richmond Grain and Cotton Exchange received during 1905, 4,500,000 bushels of grain, and 162,200 barrels of flour.

Greater Norfolk (including Norfolk, Portsmouth, Berkley and U. S. Navy Yard).—Norfolk is not only Virginia's most important port, but one of the most important in the South. Among Southern ports it ranks first in lumber, first in peanuts, second in coal, and fourth in cotton shipments.

The city is situated at the junction of the southern and western branches of the Elizabeth River, which is tributary to the James River Estuary, of which Hampton Roads is the connecting channel with the Chesapeake Bay. The James River has no bar at its mouth, and there are 30 feet of water at low tide. The distance of Norfolk from the ocean is 32 miles, and from Hampton Roads 8 miles. As to the special advantages of the Norfolk harbour, I quote from the report of Commodore M. F. Maury: "Norfolk, be it remembered, with its deep waters, spacious harbors and free outlet between the Capes of Virginia to the sea, occupies geographically what the early discoverers thought would be, and what physical geography claims is, the most commanding commercial position along the whole Atlantic seaboard of the United States. Its natural advantages make it so."*

There are 30 miles of wharf frontage. The outer harbour contains 50 square miles of anchorage ground, with a depth of 50 feet; and the inner harbour (Elizabeth River and its branches) has 1,000 acres of anchorage ground, with a depth of 28 feet. Portsmouth† is just across the river from Norfolk, and has a harbour frontage of one mile.

The traffic of the southern branch of the Elizabeth River in 1905 showed a great increase over any previous year, being about 11,000,000 tons, valued at more than \$500,000,000.‡

Norfolk ranks first as a rehandling, and foreign and domestic export point; and in the variety and volume of manufactures ranks next to Richmond. The largest enterprise is the United States Navy Yard at Portsmouth, which employs more than 2,000 wage-earners at a total cost of \$2,000,000 per year. The following important industries enter into the general supplies and traffic of the State: Fertilizer, tobacco, lumber and iron mills, cotton factories, cotton compresses, packing-houses, peanut factories, fisheries, brick factories, farming implements, and shoe factories. The total value of manufactures was estimated for 1905 at \$34,400,000. Fertilizer, tobacco (manufactured), canned meats, peanuts, and oysters are

* Physical Survey of Virginia, M. F. Maury, 1876, p. 20.

† Considered a part of Greater Norfolk.

‡ Report of Chief of Engineers, U. S. Army, 1906, p. 238.

shipped to all parts of the State. The Norfolk jobbing and wholesale houses do a large business in Tidewater, eastern and south-eastern Piedmont, and North Carolina. It is the largest horse market in the South, the aggregate sales of 1905 being \$2,500,000.

The volume of the traffic going into Greater Norfolk far exceeds that of any other point in Virginia. The most important classes are in the order of tonnage: Lumber, iron, coal, grain, garden products, live-stock, cotton,* and tobacco. The lumber comes from Appalachia, the Valley, Blue Ridge, Piedmont, and from North Carolina, Tennessee, and West Virginia; the coal from Appalachia, the States of Kentucky and West Virginia; the grain and live-stock from all parts of the State, and the Middle West; the garden products from Tidewater and Piedmont chiefly, the cotton from Virginia, North and South Carolina; and the tobacco from Piedmont.

Newport News† is situated on the northern shore of Hampton Roads, 20 miles due west from Cape Henry. The depth of the water off piers is 60 feet. There are ten miles of water front, and good anchorage. The port is served by 18 regular steamship lines. The total tonnage for 1905 was 4,717,858 tons‡ valued at \$89,816,686. About three-fourths of the total tonnage consisted of coal and coke. It is the seaboard terminus of the Chesapeake and Ohio Railroad, which intersects more intra-State lines than any other road operating in the State, and about three-fourths of its traffic is supplied by the connecting lines. The most important classes of coast-bound traffic originating in Virginia are: Grain, live-stock, lumber, tobacco, and garden products. Newport News is an important distributing centre for merchandise, furniture, farming implements, and machinery, which go to all parts of the State north of the James River, and a small part is diverted to the connecting lines from the South.

Lynchburg.§—As an inland railroad centre Lynchburg ranks next to Richmond in importance. Although Lynchburg is now entirely an inland town, its early importance as a trade centre was fixed by the James River Canal, which was the most important transportation route from the seaboard to the interior part of the State, until the construction of the Norfolk and Western Railroad. Lynchburg was the handling station of all goods destined for south-west Virginia, western North Carolina, and the northern part of the east Tennessee

* 822,930 bales of cotton shipped from Norfolk in 1905, valued at \$40,000,000.

† Population, 28,749, in 1906.

‡ Tonnage in 1902, 2,663,669 tons.

§ Population 20,000 + in 1906.

country. The old Lynchburg-Knoxville pike was constructed for the convenience of this traffic. The James River ceased to be navigable above Richmond when it became unprofitable to operate the canal, after which time Lynchburg's importance was due to the trade stimulus as fixed by the old transportation régime, and the later railroad facilities. In total manufactures and the jobbing trade it ranks next to Norfolk. The 1906 factory output was valued at \$15,000,000. The important manufactures are: Shoes, foundry products, tanning extracts, cotton goods, flour, and farming implements. In the manufacture of shoes it ranks first among the cities of the South. The products are sold throughout Piedmont, and the western part of the State. Lynchburg is the largest shoe-distributing point in the South, and its shoes are sold, not only in all parts of Virginia, but throughout the South Atlantic States.

*Roanoke** may be justly termed a railroad town, as its size and trade have been largely produced by the Norfolk and Western Railroad, of which it is headquarters. The company employs 4,700 operatives, who have their homes in the city. It is situated on the main line (Bristol-Norfolk) of the Norfolk and Western railway, and is the southern terminus of the Shenandoah Valley and the northern terminus of the Roanoke and Southern railroads, both of which are owned and operated by the Norfolk and Western. The geographic location and railway service, therefore, make it the eastern gateway into south-west Virginia, and the southern gateway into the Valley. The jobbing and retail trade have steadily increased, and manufacturing enterprises have begun to be extensively developed. Roanoke will be a division terminus for the trans-State Tidewater railroad, which, added to its present prosperous trade relations, bids fair to make it the largest and most important exclusively inland city of Virginia. The most important outgoing shipments are: Groceries, iron products, general merchandise, and alcoholic drinks; and the most important incoming shipments are lumber, grain, vegetables, and tobacco.

Bristol† is located on the Virginia-Tennessee boundary, and, as the terminus of five different railroads, is an important rehandling station and distributing centre. It is southern Appalachia's most direct gateway to the south and east, and is, therefore, an important trade centre for that region, and the southernmost portion of the Great Valley.

Three of the railroads operating from the city as a base have their

* Population 30,000 in 1905.

† Population 15,000 in 1905.

General Offices there. It is also the headquarters of the Virginia Iron, Coal and Coke Company, with a capital of more than \$10,000,000. The most important manufactures are: Iron, lumber products, paper, tanning extract, tobacco, flour, and chemicals.

The value of the manufactures and trade has been more than doubled in the last decade. The manufactures of 1906 are valued at \$10,500,000; exclusive of lumber, coal, and iron products, valued at \$10,000,000. The jobbing trade aggregated \$9,000,000, which shows Bristol's importance as a distributing point.

*Danville** is at the crossing of the Southern and the Danville and Western railroads. It is the largest loose-leaf tobacco market in the world, handling from 45,000,000 to 55,000,000 pounds annually. Tobacco is the principal farm product of the region, and the most important article in trade. The city is situated on the Dan River, which has sufficient volume and favourable fall for the establishment of large factory enterprises. Already two cotton mills have been established, with a combined capital stock of \$4,500,000, which furnish employment to more than 4,000 wage-earners.

INTER-STATE COMMERCE.

Though Virginia is making marked progress in the development of manufacturing enterprises, these have not reached such proportions as to make the State an important purchaser of raw materials. The rapid development of cotton factories creates an increasing demand for raw cotton. In 1900 there were only 7 factories within the State; while in 1905 there were 32, which consumed 57,223 bales, an excess of 39,049 bales over the total production of the State. The most important shipments, therefore, from other States for domestic use consist of manufactured products. There are large shipments from other States into Virginia, destined for eastern and foreign markets, which require rehandling; and for these due allowance must be made in the consideration of the aggregate port trade, since no separate record is kept at the ports of the traffic originating within the State, and without the State. This rehandled traffic creates a large demand for labour, sorting, transfer, and shipping facilities, and in that way becomes an important factor in the State's traffic and trade. The products consist chiefly of lumber, cotton, and tobacco from North Carolina; lumber and live-stock from Tennessee; and lumber, coal, and coke from West Virginia.

Virginia produces a large surplus of raw and manufactured

* Population in 1900, 16,520.

tobacco, garden products, forest products, coal and coke, live-stock, and peanuts; and a small surplus of fruits, poultry products, leather, meats, and iron. These constitute the bulk of the outgoing tonnage, the major portions of which are sold in the North Atlantic and New England States. The most important markets are: New York, Philadelphia, Boston, Baltimore, and Washington. Large shipments of live-stock are made to Lancaster, Pennsylvania, from which point they are sold to the farmers of Pennsylvania for winter fattening.

The inter-State shipments of live-stock, tobacco, cotton, and vegetables are largely by rail. More than three-fourths of the seaboard lumber traffic, and more than one-half of the seaboard coal shipments, are by water. Cotton is shipped almost exclusively by water. The coastwise trade centres in Norfolk, Newport News, and Richmond.

FOREIGN COMMERCE.

The total imports into the State for 1905 were valued at \$10,885,628, and the exports at \$23,409,119. The imports were largely general merchandise, and the exports coal, live-stock, grain, flour, cotton, tobacco, lumber, and meats.*

Newport News.—The total exports† from this port for 1906 were valued at \$18,693,803, which is an increase of 18 per cent over 1905.‡ The following are the important classes, in the order of valuation: Flour, \$3,095,649; lumber, \$1,454,096; lard, \$1,231,201; copper, ingots, &c., \$1,100,623; tobacco, \$1,038,483; coal, \$925,275; linseed oil cake meal, \$869,632; cotton, \$506,056. The imports aggregated \$2,723,788, an increase of 26 per cent. over 1905.§ The following are the most important, in the order of valuation: Burlap, \$376,388; jute bags, \$336,025; plate-glass, \$265,546; alcoholic drinks, \$231,903; earthenware, \$165,403; and cocoanut oil, \$142,728.

Norfolk and Portsmouth.||—The following are the important exports from this port, in the order of valuation:¶ Lard, \$1,180,441; coal, \$1,111,725; lumber, \$1,000,000; cotton, \$943,031; grain and flour, \$780,487; tobacco, \$329,729; and cattle, \$305,300. The total exports were valued at \$7,640,800 for the year ending December, 1905, as compared with \$8,256,519, the total imports for the same year, which consisted of merchandise, chemicals, alcoholic drinks,

* The coastwise trade for the same year was about twelve times the total foreign trade.

† Newport Custom House Report, 1906.

‡ Exports in 1905, \$15,750,310.

§ Imports in 1905, \$2,154,650.

|| In the same Custom House district.

¶ 1905.

